



Otis Elevator Company
Law Department

10 Farm Springs
Farmington, Connecticut 06032
203/676-6000
FAX: 203/676-5035

August 26, 1996

Via facsimile and Courier

Ms. Amelia Wagner
Assistant Regional Counsel
Office of Regional Counsel
U.S. Environmental Protection Agency
290 Broadway, 17th Floor
New York, NY 1007-1866

Re: Response of Otis Elevator Company to Request for Information Regarding Diamond Alkali Superfund Site, Passaic River Study Area

Dear Ms. Wagner,

Attached please find the response of Otis Elevator Company to the above referenced request for information, which is due today. This response is being telefaxed to you today, with the original and attached documents being sent by overnight mail. If you do not receive the original with attached documents by tomorrow, please feel free to call me. We are planning on attending the meeting scheduled for Thursday, August 29, 1996.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "J. Santos", with a long horizontal flourish extending to the right.

Joseph A. Santos
Assistant Counsel
North American Operations

JAS/kv
enc.
cc: Pat Dawson

AUG 27 1996

851130001

**RESPONSE OF OTIS ELEVATOR COMPANY TO REQUEST FOR
INFORMATION RE: DIAMOND ALKALI SUPERFUND SITE,
PASSAIC RIVER STUDY AREA**

1. Otis began operations at 1000 First Street (the "Harrison Plant" or the "Plant") in 1910. The Plant closed in approximately 1979-1980. It operated for approximately 69 years and closed more than 16 years ago. Because of the extensive passage of time, it has been difficult to locate information regarding the Plant. The attached documents provide a perspective.

2. (a): We are not aware of any such permits, for the Harrison Plant.

(b): We are not aware of any such permits for the Harrison Plant, which closed in approximately 1979-1980.

3. We are not currently aware that the Harrison Plant utilized, manufactured, discharged, released, stored or disposed of any of the materials listed in question no. 3.

4. (a): Since the Harrison Plant closed more than 16 years ago, it has thus far been difficult to determine the precise manufacturing processes utilized there. Generally, the purpose of the Harrison Plant was to form elevator cabs, doors and platforms. For the portion of time within memory of persons interviewed, the manufacturing process generally involved receiving sheet metal and steel beams from other sources and then bending, cutting and stamping metal into the shapes required to form the products. Metal scrap was collected and sold for profit to a metal scrap dealer in Harrison. Also, for a period of years the Plant manufactured airplane engine crankcases under direction of the U.S. Government.

Based upon the documents reviewed and attached, and the persons spoken to, we have not learned of specific hazardous substances which would have been a product or by-product of the manufacturing process, with the possible exception of the following:

There was a small section of the Harrison Plant that performed spray painting, in enclosed booths. However, the excess paint was collected into 55-gallon drums, which then were sealed and stored in the parking lot until collected and taken off-site by a waste hauler.

4. (b): (i) -- See response to 4(a) above.

(ii) -- We are not currently aware of the volume of the paint described above.

- (iii) -- We have no information, and no reason to believe, that the paint described above, which was collected into sealed drums until hauled away by a waste hauler, was combined with any other wastes.

5. See response to question 4 above. No other information is known at the present time.

6 (a): We have no current information regarding the use of process waste water at the Plant.

(b): It is believed that there may have been floor drains in portions of the Harrison Plant and that these were connected to the sewer lines. We currently have no additional information regarding the portion of the Plant, the years, or pretreatment.

(c): We are not aware of any catch basins or lagoons at the Plant.

(d): We are not aware of any such diagrams.

(e): We have not located any information regarding the alleged incident. We request that EPA share with us the information available to it.

(f): We have not located any information regarding the alleged incident. We request that EPA share with us the information available to it.

7. (a): We currently have no such information.

(b): We have no information about any discharges by the Harrison Plant into the Passaic River. We also have no information regarding sampling of the Passaic River by Otis.

8. (a) and (b): We have no information regarding leaks, spills, fires or other incidents of accidental material discharge at the Harrison Plant. Please see the attached documentation for the reference to an explosion in the 1930s of a container of natural gas that had been left at one of the Plant buildings by the former owner of the Plant.

We do not currently have information regarding any soil, water or air sampling at the Plant.

9. (a) and (b): We currently have no information regarding flooding of or on the Plant. Former employees with whom we spoke could not recall any such flooding.

10. We are not aware of any records of any civil, criminal or administrative proceedings against our Company due to operations of the Plant. We have no information regarding the Administrative Order allegedly issued to our Company on October 3, 1969, which now would have been more than 25 years ago. We request that EPA share with us the information available to it.

11. We are not currently aware of such documents.

12. We are not aware of any soil, water, groundwater, air or other environmental media samples from the Harrison Plant.

13. (a-c): The Harrison Plant operated from 1910 until approximately 1979-1980. As reflected in some of the attached documents the Plant began with a limited number of buildings and space originally purchased from the Marine Engine and Machinery Company, and both increased and decreased in capacity and size during its 69 years of operation. During those years there were a large number of purchases and sales to and from individuals and corporations. There also may have been various lease relationships, but we do not currently have specific information regarding such transactions. Attached are some of the deeds of sale we have thus far located, relating to the sale transactions at the end of operations.

14. (a): Otis Elevator Company, a New Jersey Company (incorporated in 1898).

(b): See the attached 1995 Annual Report of United Technologies.

(c): New Jersey.

Agent for Service of Process is: CT Corporation Trust Company
28 West State Street
Tranton, New Jersey 08608

(d): See attached (restated) copy.

(e): United Technologies purchased Otis Elevator Company in 1974. Otis is a wholly owned subsidiary.

(f): N/A.

(g and h): There have been a large number of such transactions, none of which should have any relevance or connection to the former operations of the Harrison Plant. As for United Technologies (reference to no. 14 (e)), please see attached 1995 Annual Report.

(i): N/A.

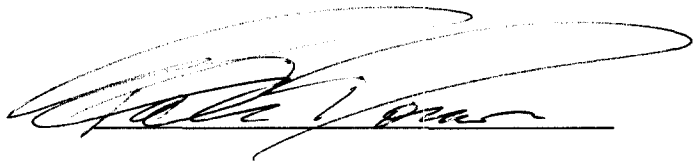
15. Person Answering:

Patrick Dowson, Director, Safety and Environment, North American Operations
Otis Elevator Company, 1 Farm Springs Road,
Farmington, Connecticut 06032

Former employees contacted to assist in response:

See attached list.

So stated to the best of my information and belief, after a review of available documents and discussions with the referenced persons.



Patrick Dowson
Director, Safety and Environment
Otis Elevator Company
North American Operations
1 Farm Springs Road
Farmington, Connecticut 06032

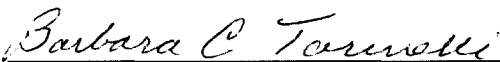
August 26, 1996

UNITED STATES OF AMERICA
STATE OF CONNECTICUT
COUNTY OF HARTFORD

)
)
)

SS: TOWN OF FARMINGTON

On the 26th day of August, 1996, before me, a Notary Public in and for said County and State, personally appeared Patrick Dowson, to me known, and said Patrick Dowson acknowledged said instrument to be his free act and deed.



Notary Public:

My Commission expires:

BARBARA C. TARINELLI
NOTARY PUBLIC

MY COMMISSION EXPIRES APR. 30, 1997

851130005

**HARRISON PLANT
PERSONS INTERVIEWED
AUGUST OF 1996**

August (Sy) Bohrer	126 Sherwood Lane Tom's River, NJ 08757
Vean Geyer	1248 Whitesville Road Tom's River, NJ 08757
Patrick Kilduff	1 Kittery Ct Whiting, NJ 08759
Charlie Richardson	121 Le Diamant St. Tom's River, NJ 08757
Henry Waclaw	1331 Curry Pike Bloomington, IN 47403
Charlie Musante	229B Manchester Rd., Route 55, Poughkeepsie, NY 12603
Bill Drummond	548 Forest Drive, River Vale, NJ 07027
Lowel Dykes	1331 Curry Pike Bloomington, IN 47403
Bob Burns	1331 Curry Pike Bloomington, IN 47403
Ed Ryan	1331 Curry Pike Bloomington, IN 47403
Bob Malinowski	521 5th Ave New York, NY 10175

List of persons interviewed by Patrick Dowson regarding their knowledge of operations at the Otis Harrison Plant.



Patrick Dowson
Director of Safety and Environment

August 26, 1996

851130006

FILED

MAR 19 1984

JANE BURGIO
Secretary of State

RESTATED CERTIFICATE OF INCORPORATION

OF

OTIS ELEVATOR COMPANY

To: The Secretary of State
State of New Jersey

Pursuant to the provisions of Section 14A:9-5, Corporations, General, of the New Jersey Statutes, the undersigned corporation hereby executes the following Restated Certificate of Incorporation:

FIRST: The name of the Corporation is Otis Elevator Company.

SECOND: The location of the principal office of the Corporation in the State of New Jersey is 15 Exchange Place, Jersey City, Hudson County, New Jersey 07302, and the name of its current registered agent at such address is The Corporation Trust Company.

THIRD: That the purpose or purposes for which the Corporation is organized are to engage in any lawful act or activity for which corporations may be organized under the general corporation laws of the State of New Jersey; and in furtherance, and not in limitation, of the general powers conferred by the laws of the State of New Jersey, it is hereby expressly provided that the Corporation shall have also the following powers:

1. To manufacture, erect, build, furnish, equip, construct, repair, maintain, operate, buy, sell, and in general to utilize and deal in and deal with elevators, escalators and related machinery, including the acquisition by purchase, manufacture or otherwise of all materials, supplies, machinery and other articles necessary or convenient for use in connection with and in carrying on the business herein mentioned, or any part thereof.

2. To make and enter into contracts of every sort and kind with any individual, firm, association, corporation, public or municipal, and with the Government of the United States, or any State or Territory thereof, or any foreign government.

3. To do all and everything necessary, suitable or proper for the accomplishment of any of the purposes or attainment of any of the purposes hereinbefore enumerated, or which shall at any time appear conducive or expedient for the protection or benefit of the Corporation, and in general to engage in any and all lawful business whatever, necessary or convenient.

FOURTH: The total number of shares of stock which the Corporation shall have authority to issue is ten million (10,000,000) shares of Common Stock, without par value.

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FIFTH: The number of directors constituting the current board of directors is five. The names and addresses of the directors are as follows:

<u>Names</u>	<u>Addresses</u>
Hubert Faure	One Financial Plaza, Hartford, CT 06101
Ralph P. Weller	750 Third Avenue, New York, NY 10022
Francois Jaulin	10 Farm Springs, Farmington, CT 06032
Stillman B. Brown	One Financial Plaza, Hartford, CT 06101
Edward W. Large	One Financial Plaza, Hartford, CT 06101

SIXTH: The duration of the Corporation shall be perpetual.

SEVENTH: 1. The Board of Directors, in addition to the powers and authorities by statute and by the By-Laws expressly conferred upon them, may exercise all such powers and do all such acts and things as may be exercised or done by the Corporation, but subject, nevertheless, to the provisions of the statute, of the charter, and to any regulations that may from time to time be made by the stockholders; provided that no regulations so made shall invalidate any provisions of this charter, or any prior acts of the Directors which would have been valid if such regulations had not been made.

2. The Corporation may in its By-Laws confer powers additional to the foregoing upon the Directors, and may prescribe the number necessary to constitute a quorum of its Board of Directors, which number may be less than a majority of the whole number.

3. The Board of Directors may, by resolution passed by a majority of the whole Board, designate two or more of their number to constitute an Executive Committee, which committee shall for the time being, as provided in said resolution or in the By-Laws of the Corporation, have and exercise all the powers of the Board of Directors in the management of the business and affairs of the Corporation, and have power to authorize the seal of the Corporation to be affixed to all papers which may require it.

4. The Board of Directors from time to time shall determine whether, and to what extent, and at what times and places, and under what conditions and regulations, the accounts and books of the Corporation, or any of them, shall be open to the inspection of the stockholders; and no stockholder shall have any right of inspecting any account or book or document of the Corporation, except as conferred by statute or authorized by the Board of Directors or by a resolution of the stockholders.

5. The Corporation may use and apply its surplus property, earnings or accumulated profits, authorized by law to be reserved, to the creation and maintenance of a surplus fund, or to the purchase and acquisition of property, and to the purchase and acquisition of its own capital stock, and may take the same in payment or satisfaction of any debt due the Corporation from time to time, to such extent, in such manner and upon such terms as its Board of Directors shall determine; and neither the surplus fund or property, nor the capital stock so purchased and acquired, nor any of its capital stock taken in payment or satisfaction of any debt due the Corporation, shall be regarded as profits for the purpose of the declaration or payment of dividends unless a majority of the Board of Directors shall otherwise determine.

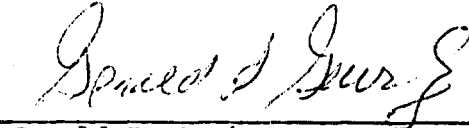
6. The Board of Directors shall have power to hold its meetings, to have one or more offices, and to keep the books of the Corporation, outside of this State, at such places as may be from time to time designated by them.

7. The Board of Directors shall have power without the assent or vote of the stockholders to make, alter, amend and rescind the By-Laws of the Corporation and to fix the amount to be reserved as working capital.

Dated this 20th day of February, 1984.

OTIS ELEVATOR COMPANY

By



Gerald I. Gewirtz
Vice President

CERTIFICATE REQUIRED TO BE FILED WITH THE
RESTATED CERTIFICATE OF INCORPORATION
OF
OTIS ELEVATOR COMPANY

Pursuant to the provisions of Section 14A:9-5(5), Corporations, General, of the New Jersey Statutes, the undersigned corporation hereby executes the following certificate:

FIRST: The name of the corporation is Otis Elevator Company.

SECOND: The Restated Certificate of Incorporation was adopted on the 20th day of February, 1984.

THIRD: At the time of the adoption of the restated certificate, the total number of shares outstanding and entitled to vote thereon was 10,000,000. In lieu of a meeting and vote of shareholders, the Restated Certificate of Incorporation was duly adopted by the shareholders without a meeting pursuant to the written consent of the shareholders in the manner provided for in Section 14A:5-6. The number of shares represented by such consent was 10,000,000 shares.

FOURTH: This Restated Certificate of Incorporation restates and integrates and further amends the Certificate of Incorporation of this Corporation, which was filed on the 28th day of November, 1898, and amended several times thereafter, by:

1. Deleting Article SECOND in its entirety and substituting the following:

"SECOND: The location of the principal office of the Corporation in the State of New Jersey is 15 Exchange Place, Jersey City, Hudson County, New Jersey 07302, and the name of its current registered agent at such address is The Corporation Trust Company."

2. Deleting Article THIRD in its entirety and substituting the following:

"THIRD: That the purpose or purposes for which the Corporation is organized are to engage in any lawful act or activity for which corporations may be organized under the general corporation laws of the State of New Jersey; and in furtherance, and not in limitation, of the general powers conferred by the laws of the State of New Jersey, it is hereby expressly provided that the Corporation shall have also the following powers:

"1. To manufacture, erect, build, furnish, equip, construct, repair, maintain, operate, buy, sell, and in general to utilize and deal in and deal with elevators, escalators and related machinery, including the acquisition by purchase, manufacture or otherwise of all materials, supplies, machinery and other articles necessary or convenient for use in connection with and in carrying on the business herein mentioned, or any part thereof.

"2. To make and enter into contracts of every sort and kind with any individual, firm, association, corporation, public or municipal, and with the Government of the United States, or any State or Territory thereof, or any foreign government.

"3. To do all and everything necessary, suitable or proper for the accomplishment of any of the purposes or attainment of any of the purposes hereinbefore enumerated, or which shall at any time appear conducive or expedient for the protection or benefit of the Corporation, and in general to engage in any and all lawful business whatever, necessary or convenient."

3. Deleting Article FIFTH in its entirety and substituting the following:

"FIFTH: The number of directors constituting the current board of directors is five. The names and addresses of the directors are as follows:

<u>Names</u>	<u>Addresses</u>
Hubert Faure	One Financial Plaza, Hartford, CT 06101
Ralph P. Weller	750 Third Avenue, New York, NY 10022
Francois Jaulin	10 Farm Springs, Farmington, CT 06032
Stillman B. Brown	One Financial Plaza, Hartford, CT 06101
Edward W. Large	One Financial Plaza, Hartford, CT 06101"

4. Deleting the words "this Company" from Article SIXTH and substituting the words "the Corporation."

5. Deleting Article SEVENTH in its entirety and substituting the following:

"SEVENTH: 1. The Board of Directors, in addition to the powers and authorities by statute and by the By-Laws expressly conferred upon them, may exercise all such powers and do all such acts and things as may be exercised or done by the Corporation, but subject, nevertheless, to the provisions of the statute, of the charter, and to any regulations that may from time to time be made by the stockholders; provided that no regulations so made shall invalidate any provisions of this charter, or any prior acts of the Directors which would have been valid if such regulations had not been made.

"2. The Corporation may in its By-Laws confer powers additional to the foregoing upon the Directors, and may prescribe the number necessary to constitute a quorum of its Board of Directors, which number may be less than a majority of the whole number.

"3. The Board of Directors may, by resolution passed by a majority of the whole Board, designate two or more of their number to constitute an Executive Committee, which committee shall for the time being, as provided in said resolution or in the By-Laws of the Corporation, have and exercise all the powers of the Board of Directors in the management of the business and affairs of the Corporation, and have power to authorize the seal of the Corporation to be affixed to all papers which may require it.

"4. The Board of Directors from time to time shall determine whether, and to what extent, and at what times and places, and under what conditions and regulations, the accounts and books of the Corporation, or any of them, shall be open to the inspection of the stockholders; and no stockholder shall have any right of inspecting any account or book or document of the Corporation, except as conferred by statute or authorized by the Board of Directors or by a resolution of the stockholders.

"5. The Corporation may use and apply its surplus property, earnings or accumulated profits, authorized by law to be reserved, to the creation and maintenance of a surplus fund, or to the purchase and acquisition of property, and to the purchase and acquisition of its own capital stock, and may take the same in payment or satisfaction of any debt due the Corporation from time to time, to such extent, in such manner and upon such terms as its Board of Directors shall determine; and neither the surplus fund or property, nor the capital stock so purchased and acquired, nor any of its capital stock taken in payment or satisfaction of any debt due the Corporation, shall be regarded as profits for the purpose of the declaration or payment of dividends unless a majority of the Board of Directors shall otherwise determine.

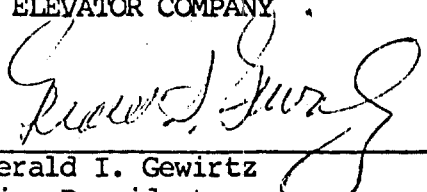
"6. The Board of Directors shall have power to hold its meetings, to have one or more offices, and to keep the books of the Corporation, outside of this State, at such places as may be from time to time designated by them.

"7. The Board of Directors shall have power without the assent or vote of the stockholders to make, alter, amend and rescind the By-Laws of the Corporation and to fix the amount to be reserved as working capital."

Dated this 20th day of February, 1984.

OTIS ELEVATOR COMPANY

By


Gerald I. Gewirtz
Vice President

This Deed, made the 16th day of December 1980 ,

Between OTIS ELEVATOR COMPANY

a corporation existing under and by virtue of the laws of the State of New Jersey ,
having its principal office at One Farm Springs, Farmington, Connecticut 06032
~~XXXXXX~~ ~~XXXXXX~~ ~~XXXXXX~~

~~XXXXXX~~

herein designated as the Grantor,

And HARTZ HARRISON LIMITED PARTNERSHIP,
a limited partnership of New Jersey

residing or located at One Harmon Plaza, P.O. Box 1411
in the Town of Secaucus in the County of
Hudson and State of New Jersey herein designated as the Grantees;

Witnesseth, that the Grantor, for and in consideration of TWO HUNDRED FIFTY
THOUSAND DOLLARS (\$250,000.00)

lawful money of the United States of America, to it in hand well and truly paid by the Grantees, at or
before the sealing and delivery of these presents, the receipt whereof is hereby acknowledged, and the
Grantor being therewith fully satisfied, does by these presents grant, bargain, sell and convey unto the
Grantees forever,

All that tract or parcel of land and premises, situate, lying and being in the
Town of Harrison in the
County of Hudson and State of New Jersey, more particularly described ~~as follows~~
in Exhibit A annexed hereto.

BEING a portion of the premises conveyed to Grantor by
Federal Land and Improvement Company by Deed dated June 26, 1929
and recorded on June 29, 1929 in Hudson County Deed Book 1720
at page 1.

Said premises are designated on the municipal tax maps
as Block 101, Lot 1-A.

851130013

Together with all and singular the buildings, improvements, ways, woods, waters, watercourses, rights, liberties, privileges, hereditaments and appurtenances to the same belonging or in anywise appertaining; and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and of every part and parcel thereof; And also all the estate, right, title, interest, use, possession, property, claim and demand whatsoever, of the Grantor both in law and in equity, of, in and to the premises herein described, and every part and parcel thereof, with the appurtenances. To Have and to Hold all and singular, the premises herein described, together with the appurtenances, unto the Grantees and to Grantees' proper use and benefit forever.

And the Grantor covenants that it has not done or executed, or knowingly suffered to be done or executed, any act, deed or thing whatsoever whereby or by means whereof the premises conveyed herein, or any part thereof, now are or at any time hereafter, will or may be charged or encumbered in any manner or way whatsoever.


In all references herein to any parties, persons, entities or corporations, the use of any particular gender or the plural or singular number is intended to include the appropriate gender or number as the text of the within instrument may require.

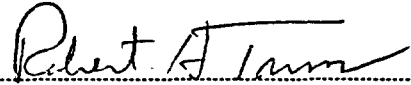
Wherever in this instrument any party shall be designated or referred to by name or general reference, such designation is intended to and shall have the same effect as if the words "heirs, executors, administrators, personal or legal representatives, successors and assigns" had been inserted after each and every such designation.

In Witness Whereof, the Grantor has caused these presents to be signed and attested by its proper corporate officers and its corporate seal to be hereto affixed the day and year first above written.

ATTEST:

OTIS ELEVATOR COMPANY


William D. Ross - Asst. Secretary
(Corporate Seal)

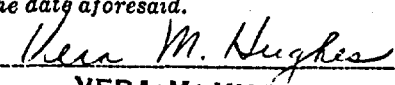
By: 
Robert H. Tansor, Vice-President

Connecticut
State of ~~DELAWARE~~ County of Hartford } ss.: Be it Remembered,
that on December 16, 1980, before me, the subscriber, a Notary Public of
Connecticut
personally appeared William D. Ross

who, being by me duly sworn on his oath, deposes and makes proof to my satisfaction, that
he is the Assistant Secretary of Otis Elevator Company
the Corporation named in the within Instrument;


that Robert H. Tansor is the Vice
President of said Corporation; that the execution, as well as the making of this Instrument, has
been duly authorized by a proper resolution of the Board of Directors of the said Corporation; that
deponent well knows the corporate seal of said Corporation; and that the seal affixed to said
Instrument is the proper corporate seal and was thereto affixed and said Instrument signed and
delivered by said Vice President as and for the voluntary act and deed of said Corpora-
tion, in presence of deponent, who thereupon subscribed his name thereto as attesting witness;
and that the full and actual consideration paid or to be paid for the transfer of title to realty evidenced
by the within deed, as such consideration is defined in P.L. 1968, c. 49, Sec. 1(c), is \$250,000.00

Sworn to and subscribed before me,
the date aforesaid.


VERA M. HUGHES
NOTARY PUBLIC

MY COMMISSION EXPIRES MARCH 31, 1985

Prepared by: Lawrence F. Reilly


Asst.
Secretary - William D. Ross

851130014

Deed

OTIS ELEVATOR COMPANY

A corporation of

NEW JERSEY
TO

HARTZ HARRISON LIMITED
PARTNERSHIP, a limited
partnership of New Jersey

Dated

December 16, 1980

851130015

ALL that tract or parcel of land and premises, situate, lying and being in the Town of Harrison, County of Hudson and State of New Jersey.

BEGINNING at the intersection of the easterly line of Second Street and the northerly line of Burlington Street and running thence:

- (1) North 02 degrees 53 minutes West along said line of Second Street 435.0 feet to the lands now or formerly of Newark Public Radio Inc. thence
- (2) North 87 degrees 07 minutes East along said lands of Newark Public Radio, Inc. 281.03 feet to lands now or formerly of Pathparc Associates; thence
- (3) South 02 degrees 53 minutes East along said lands of Pathparc Associates 435.0 feet to the northerly line of Burlington Street; thence
- (4) South 87 degrees 07 minutes West along said line of Burlington Street 281.02 feet to the point and place of BEGINNING.

EXHIBIT A

DEED

OTIS ELEVATOR COMPANY, a
New Jersey corporation

↑ For use of Recording Officer ↑

↓ RECORD AND RETURN TO: ↓

TO
PATHPARC ASSOCIATES, a
partnership

↑ For use of Recording Officer ↑

THIS DEED made the *3d* day of *February* in the year 19*78*

BETWEEN OTIS ELEVATOR COMPANY, a New Jersey corporation,

hereinafter referred to as the Grantor, a corporation of the State of New Jersey, having its principal

office at 245 Park Avenue, New York, New York 10017

and

PATHPARC ASSOCIATES, a partnership

hereinafter referred to as the Grantee, whose post office address is or is about to be:

~~XXXXXXXXXXXXXXXXXXXXXXX~~ West Orange, New Jersey 07052

17 Oak Avenue

WITNESSETH: That in consideration of the sum of TWO HUNDRED EIGHTY-SIX THOUSAND
(set forth dollar amount in words and figures)
FIVE HUNDRED DOLLARS (\$286,500.00)

the Grantor does grant and convey to the Grantee all the following described lands located in:

Property in the Town of Harrison, County of Hudson and State of
New Jersey.

Beginning at a point formed by the intersection of the Westerly line of
Third Street with the Northerly line of Burlington Street, thence

(1) Along the Westerly line of Third Street N 02° 53' 00" W 620.00 feet;
thence

(2) S 87° 07' 00" W 268.39 feet; thence

(3) S 02° 53' 00" E 620.00 feet to the Northerly line of Burlington
Street; thence

(4) Along the Northerly line of Burlington Street N 87° 07' 00" E 268.39
feet to the point of Beginning.

Being also known as lots 23 to 32 and part of lot 33 in Block 100, lots
13 to 32 and part of lots 12 and 33 in Block 101, lots 13 to 32 and part of
lots 12 and 33 in Block 102 on the Tax Map of Town of Harrison, New Jersey
together with vacated portions of Somerset Street and Hunterdon Street.

BEING a portion of the premises conveyed to the Grantor by Federal Land
and Improvement Company by Deed dated June 26, 1929 and recorded on the
same date in Hudson County Deed Book 1720 at page 1, and by Deed of Radio
Corporation of America dated November 4, 1957 and recorded on November 12,
1957 in Book 2733 at page 490.

The Grantor covenants that it has done no act to encumber said lands.

IN WITNESS WHEREOF, the Grantor has caused this Deed to be signed either by its President or Vice President and attested either by its Secretary or Assistant Secretary the day and year first above written.

OTIS ELEVATOR COMPANY

By:

Robert H. Tansor
ROBERT H. TANSOR

Attest:

William D. Ross
WILLIAM D. ROSS
(Corporate Seal)

STATE OF Connecticut }
COUNTY OF Hartford } ss.

BE IT REMEMBERED that on this 3rd day of February 1978 before me, an officer authorized to take acknowledgments and proofs, personally appeared the undersigned deponent who, being by me duly sworn, deposed and made proof to my satisfaction that he is the Assistant Secretary of the Grantor in the foregoing Deed and Robert H. Tansor is the Vice President thereof; that the Deed was signed by said Vice President in the presence of the deponent, who thereupon subscribed his name as the attesting witness, affixed the corporate seal of the Grantor and made delivery of the Deed, all of which was done as the voluntary act and deed of the Grantor pursuant to a resolution of its board of directors. Deponent further stated that the full and actual consideration paid or to be paid for the transfer of title to realty evidenced by the within deed, as such consideration is defined in P. L. 1968, C. 49, Sec. 1(c), is \$ 286,500.00

Sworn and subscribed before me the day and year first above written in this certificate of proof.

William D. Ross
WILLIAM D. ROSS

↓ Stamp or type name and title of officer ↓
making certificate of proof

DOMINA P. RUOT
NOTARY PUBLIC
Sole and Separate
My Comm. expires on 12/31/80

This Deed was prepared by: Lawrence F. Reilly, Esq.

851130018

19 80 ,

a corporation existing under and by virtue of the laws of the State of New Jersey, having its principal office at One Farm Springs, Farmington, Conn. 06032
~~xxx the~~ ~~xxx~~ ~~xxx the County of~~
~~xxx state of~~ ~~xxx~~ ~~xxx~~ herein designated as the Grantor,
 And HARRISON RIVERSIDE LIMITED PARTNERSHIP,
 a limited partnership of New Jersey

All that tract or parcel of land and premises, situate, lying and being in the Town of Harrison in the County of Hudson and State of New Jersey, more particularly described as follows in Exhibit A annexed hereto.

851130019

Together with all and singular the buildings, improvements, ways, woods, waters, watercourses, rights, liberties, privileges, hereditaments and appurtenances to the same belonging or in anywise appertaining; and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, and of every part and parcel thereof; And also all the estate, right, title, interest, use, possession, property, claim and demand whatsoever, of the Grantor both in law and in equity, of, in and to the premises herein described, and every part and parcel thereof, with the appurtenances. To Have and to Hold all and singular, the premises herein described, together with the appurtenances, unto the Grantees and to Grantees' proper use and benefit forever.

And the Grantor covenants that it has not done or executed, or knowingly suffered to be done or executed, any act, deed or thing whatsoever whereby or by means whereof the premises conveyed herein, or any part thereof, now are or at any time hereafter, will or may be charged or encumbered in any manner or way whatsoever.

In all references herein to any parties, persons, entities or corporations, the use of any particular gender or the plural or singular number is intended to include the appropriate gender or number as the text of the within instrument may require.

Wherever in this instrument any party shall be designated or referred to by name or general reference, such designation is intended to and shall have the same effect as if the words "heirs, executors, administrators, personal or legal representatives, successors and assigns" had been inserted after each and every such designation.

In Witness Whereof, the Grantor has caused these presents to be signed and attested by its proper corporate officers and its corporate seal to be hereto affixed the day and year first above written.

ATTEST:

OTIS ELEVATOR COMPANY

William D. Ross
William D. Ross - Assistant Secretary
(Corporate Seal)

By: Robert H. Tansor
Robert H. Tansor - Vice-President

Connecticut

State of ~~Massachusetts~~ County of Hartford } ss.: Be It Remembered,
that on December 16, 1980, before me, the subscriber, a Notary Public of
Connecticut
personally appeared William D. Ross

who, being by me duly sworn on his oath, deposes and makes proof to my satisfaction, that
he is the Assistant Secretary of Otis Elevator Company
the Corporation named in the within Instrument;
that Robert H. Tansor is the Vice
President of said Corporation; that the execution, as well as the making of this Instrument, has
been duly authorized by a proper resolution of the Board of Directors of the said Corporation; that
deponent well knows the corporate seal of said Corporation; and that the seal affixed to said
Instrument is the proper corporate seal and was thereto affixed and said Instrument signed and
delivered by said Vice President as and for the voluntary act and deed of said Corpora-
tion, in presence of deponent, who thereupon subscribed his name thereto as attesting witness;
and that the full and actual consideration paid or to be paid for the transfer of title to realty evidenced
by the within deed, as such consideration is defined in P.L. 1968, c. 49, Sec. 1(c), is \$ 5,750,000.00

Sworn to and subscribed before me,
the date aforesaid.

Vera M. Hughes
A Notary Public of Connecticut
VERA M. HUGHES
NOTARY PUBLIC

} William D. Ross
Asst. Secretary - William D. Ross

MY COMMISSION EXPIRES MARCH 31, 1985
Prepared by: Lawrence P. Reilly

851130020

JOHN ZANETAKOS ASSOCIATES, INC.

ENGINEERS - PLANNERS - SURVEYORS
30 GREENWOOD AVENUE
WAYNE, NEW JERSEY
07470

JOHN L. ZANETAKOS, P.E. & L.S.
ZAFIRIS GIVELIS, P.E.
ARTHUR HANSON, L.S.

11/12/80

#6387

Deed description of a parcel of land situate between the westerly side of Second Street and the Passaic River in the Town of Harrison, Hudson County, New Jersey.

Beginning at the point of intersection of the westerly side of Second Street (60' wide) with the southerly side of New Jersey Railroad Avenue and running: thence

1. S $03^{\circ} 15' 10''$ E 1466.98 feet along the westerly side of Second Street (60' wide) to a point on the lands N/F Pennsylvania Railroad; thence
2. S $55^{\circ} 41' 12''$ W 355.39 feet along the northerly side of lands N/F Pennsylvania Railroad to a bend; thence
3. S $50^{\circ} 53' 17''$ W 84.91 feet still along the northerly side of lands N/F Pennsylvania Railroad to a point on the easterly Pierhead and Bulkhead Line of the Passaic River; thence
4. N $22^{\circ} 59' 10''$ W 1072.06 feet along the easterly Pierhead and Bulkhead Line of the Passaic River to a bend; thence
5. N $17^{\circ} 42' 10''$ W 585.00 feet still along said easterly Pierhead and Bulkhead Line of the Passaic River to a bend; thence
6. N $18^{\circ} 55' 10''$ W 54.49 feet still along said easterly Pierhead and Bulkhead Line of the Passaic River to a bend; thence
7. N $46^{\circ} 24' 30''$ E 39.35 feet to a point; thence
8. N $72^{\circ} 55' 00''$ E 57.75 feet to a point; thence
9. N $66^{\circ} 04' 46''$ E 92.75 feet to a point on the southerly side of New Jersey Railroad Avenue; thence
10. N $86^{\circ} 44' 50''$ E 723.07 feet along the southerly side of New Jersey Railroad Avenue to the point of beginning:

Containing 24.749 Acres.

11/12/80

#6387

Being known as the following Lots on the Town of Harrison Tax Maps:

Lots 1-19, 20A, 22-26	Block 73
Lots 1-23	Block 74
Lots 1-13	Block 75
Lots 1-6, 16 & 17	Block 76
Lots 37 & 38	Block 77
Lots 1-7, 11 & 12	Block 80
Lots 1-30, 32, 33, 36, 37, 39	Block 81
Lots 1-36	Block 82
Lots 1-36	Block 83
Lots 1-37	Block 84
Lots 1-38	Block 85
Lots 1-37	Block 86

Subject to all easements, rights of ways and agreements of record.

Subject to such statement of facts that an accurate title search may disclose.

Description refers to map entitled "Boundary Survey of Otis Elevator Property for Hartz Mountain Industries, Inc.", prepared by John Zanetakos Associates, Inc., dated November 4, 1980.

Robert H. Tansor

and William D. Ross

being duly sworn, depose and say that they are the/President and/Secretary, respectively, of Otis Elevator Company
 Vice Asst.

a corporation existing under and by virtue of the Laws of the State of New Jersey
 address One Farm Springs, Farmington, Connecticut 06032
 that they reside at 82 Carriage Drive, Avon, Connecticut 06001
 and 5 Harvest Hill Road, West Simsbury, Connecticut 06092

respectively; that they are citizens of the United States, eighteen years of age and upwards; and that said corporation is now in possession, and the owner in fee simple, of the premises in the Town of Harrison, Hudson County, New Jersey bounded on the east by Second Street, on the west by the Passaic River, on the south by lands now or formerly of the ~~XXXX~~ ~~XXXX~~ to be conveyed by it to Harrison Riverside Limited Partnership

Deponents further say that the said premises have been held by said corporation for 34 years last past, and that its possession thereof has been peaceable and undisturbed, and that its title thereto has never been disputed or questioned to their knowledge, nor do deponents know of any facts by reason of which said possession or title might be disturbed or questioned, or by reason of which any claim to said premises, or any part thereof, might arise or be set up adverse to said corporation; that they are informed and believe that the said corporation's grantor, and those under whom said grantor claimed title to the above mentioned premises held the said premises for more than twenty years prior to the transfer to it; and that no person or persons have any contract for the purchase of, or claim to or against said premises, except as hereinafter stated; and that the same are free and clear of all taxes, incumbrances or liens by mortgage, decree, judgment or by statute, or by virtue of any proceeding in any Court, or filed in the office of the clerk of any County or Court in this State, that no work has been done or materials furnished to said premises, for the past four months, that there are no outstanding claims for the furnishing of material or labor, for the erection, construction, or alteration of any building on said premises whereby the same are now or might become subject to mechanic's or other liens. That there are no prospective assessments for improvements which have already been made on or about said premises and that the said premises are free and clear of all other liens of every nature or description, save and except the items listed in Schedule B-II of Commitment for Title Insurance NE-5212 of Pioneer National Title Insurance Company, and the items listed on page 5 of the Contract of Sale dated August 15, 1980 between Otis Elevator Company and Harrison Riverside Associates. The statements contained in this Affidavit are based upon the facts known by deponents. It is not the intention of deponents to make any statement or representation with respect to the title to the property concerning facts existing prior to the date Otis Elevator Company took title to the subject property. It is also not the intention of deponents by this affidavit to expand the obligations of Otis Elevator Company to the grantor.

There are no Franchise, Unemployment Compensation or Federal Social Security taxes due and owing from said corporation; it does not hold title to the premises for the benefit or on behalf of any foreign country or contrary to any regulation or law of the State of New Jersey, the United States or executive order of the President of the United States, pertaining to the control of foreign funds, assets and property; at no time since April 8th, 1940 has any foreign country or national thereof had any interest of any nature whatsoever, direct or indirect, in the premises. Such corporation has executed no chattel mortgage or conditional bill of sale, which remains unpaid, affecting any equipment, apparatus, personal property or fixtures to be used in connection with the premises; to the best of deponents knowledge and belief no such chattel mortgage or bill of sale executed by any prior owner remains unpaid.

The premises are now occupied as follows: By Otis Elevator Company.

Deponents further state that the execution and acknowledgment of the Deed from said corporation to Harrison Riverside Limited Partnership this day executed, as well as the making of this affidavit of title have been duly authorized by a proper resolution of the board of directors of the said corporation, a copy of which resolution, verified by the seal of said corporation, is attached hereto and made a part hereof; that the said corporation is legally authorized to transact its business in the State of New Jersey; that no proceeding of any nature is now pending in, and no order of any kind has been passed by any Court of the State of New Jersey or any other jurisdiction, to restrain said corporation from doing business in said State in accordance with its charter; that said corporation has never changed its name; and that there are no judgments, decrees, or attachments, recognizances and bail bonds or orders of any Court or officer for the payment of money against the said corporation, or to which it is a party, unsatisfied, or not cancelled of record in any of the Courts, or before any officer of the United States or of this State, or any suit or proceeding pending anywhere affecting the said premises, to their knowledge, information or belief; and that no proceedings in bankruptcy or insolvency have ever been instituted by or against said corporation.

Deponents further state that the matters and fact above contained are within their personal knowledge and are not based on hearsay, and that this affidavit is made to induce Harrison Riverside Limited Partnership

to accept a Deed to said premises, and pay the consideration therefor, knowing that the said Harrison Riverside Limited Partnership

relies upon the truth of the statements herein contained.

Subscribed and Sworn to before me

this 16th day of December 19 80

Vern M. Hughes

Robert H. Tansor
 Robert H. Tansor, Vice President
 Otis Elevator Company

William D. Ross
 William D. Ross, Assistant Secretary
 Otis Elevator Company

851130023

Pennsylvania Railroad and on the north by New Jersey Railroad
Avenue and tax lot 21 in block 73,

beyond those arising from the Contract of Sale and the covenants
of the Deed.

War Production

OTIS ELEVATOR COMPANY

OTIS-FENSOM ELEVATOR COMPANY, LIMITED

WAYGOOD-OTIS, LIMITED

WAYGOOD-OTIS (AUSTRALASIA) PTY., LIMITED

**THE STORY
OF THEIR ACTIVITIES
DURING WORLD WAR II**

Copyright 1947, Otis Elevator Company

851130025

4 August 1945

I am pleased to inform you that you have won for the fourth time the Army-Navy Production Award for outstanding achievement in producing materials essential to the war effort.

Victory in Europe has been achieved, but victory in the Pacific is still in the future. You appreciate the importance of production to that end.

I am pleased to announce that on the fourth time the Army-Navy Outstanding Achievement in producing material for the war effort.

Victory in Europe has been achieved, but victory against Japan lies still in the future. You appreciate, I am sure, the great importance of production to that end.

The Star added to your Army-Navy citation with it the thanks and

Victory in Europe
at Japan lies still in the
sure, the great importance of produ
- victory.

This third White Star added to your Army-Navy
Production Award flag carries with it the thanks and
 congratulations of our Armed Forces.

Sincerely yours,

W. H. P. P.

Sincerely yours,

Robert P. Patterson
Under Secretary of War

Mr. C. C. Campbell, Works Manager
Otis Elevator Company
Harrison Works (Elevator Division)
605 First Street
Harrison, New Jersey

Dear Mr. Campbell:

Mr. Campbell:
This is to inform you and all employees
of the Harrison Works (Elevator Division) of the
Otis Elevator Company that the Army and Navy are
conferring upon your plant the Army-Navy "E" Award
for outstanding achievement in the production of
war materials.

Although, the war in Europe has been
conditional surrender of the armed f
there is still a bitter war in
be won. Your effort, as
production record, will be
unconditional sur

This is to inform you that the Army-Navy, Harrison Works (Elevator) Company, is conferring upon your plant the outstanding achievement in the production of materials.

Although, the war in Europe has been ended by the unconditional surrender of the armed forces of the enemy, there is still a bitter war in the Pacific that must be won. Your effort, as shown by your remarkable production record, will be a great factor in hastening the unconditional surrender of Japan.

In conferring this award, the Army and Navy are proud to fly above your plant, and to every individual within it a leadership on the production of materials.

Sincerely yours,
 [Signature]

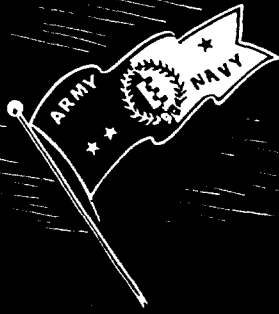
Although, the war is unconditional surrender to the enemy, there is still a big job that must be won. Your efforts in hastening the unconditional surrender in remarkable production record, will give you a flag to fly above your plant, and will present to every individual within it a label pin symbolic of leadership on the production front.

Sincerely yours,

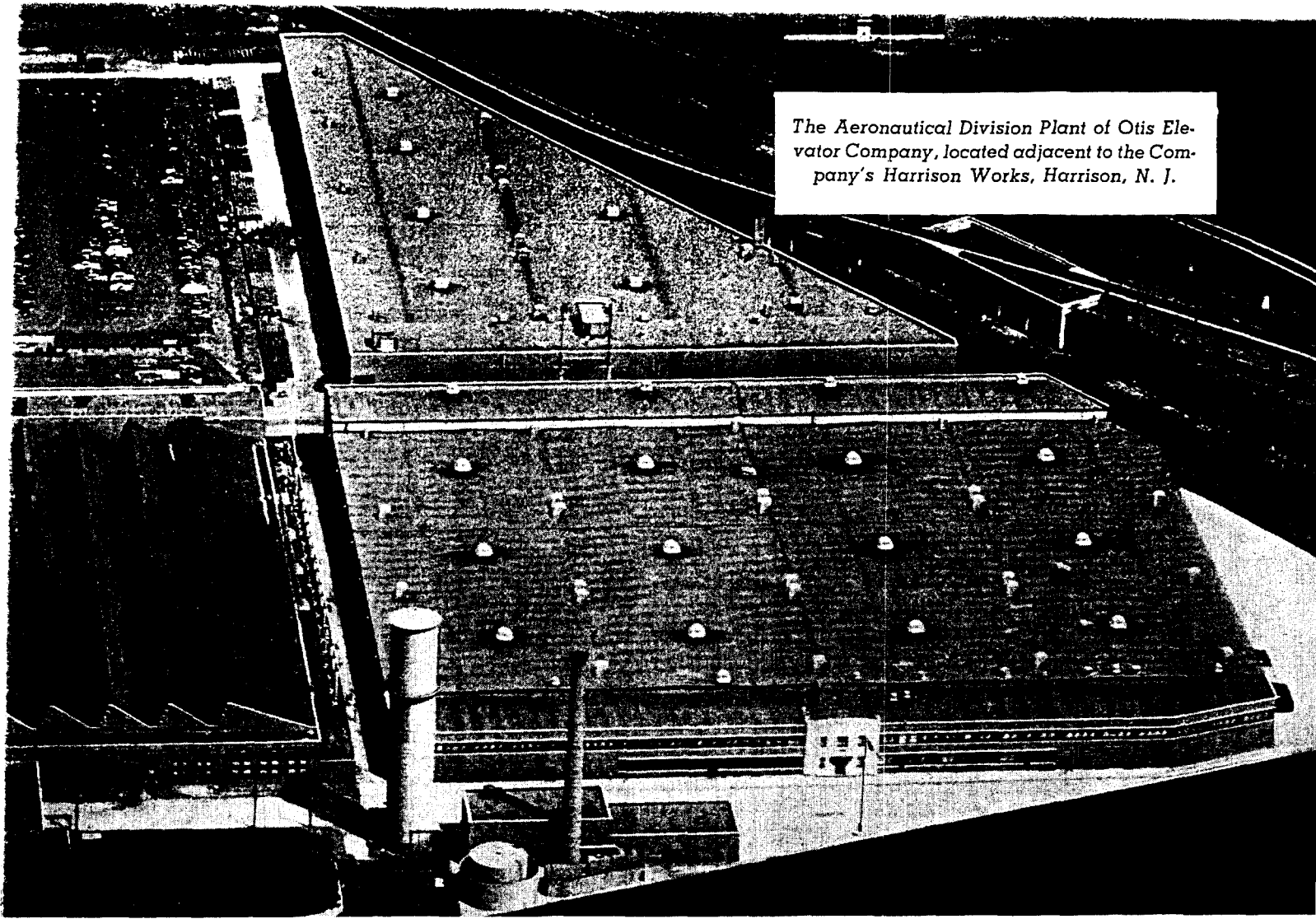
K. H. Struve

Sincerely yours,

Sincerely yours,
H. H. Hrusel



851130026



The Aeronautical Division Plant of Otis Elevator Company, located adjacent to the Company's Harrison Works, Harrison, N. J.

CRANK CASES FOR FIGHTERS, BOMBERS AND SUPERFORTS

THE production of crank cases for Wright Cyclone airplane engines was the largest single project carried on by Otis Elevator Company as part of its war effort. Within the Otis organization, this undertaking was equaled in magnitude only by the Otis-Fensom 40 mm Bofors project.

It was in the summer of 1940 when Wright Aeronautical Corporation first started talking to Otis Elevator Company about the manufacture of crank cases for their 14-Cylinder Cyclone engine. At that time, production of three hundred crank cases per month was contemplated and considerable study was devoted to the possibility of accomplishing

this in the Company's Buffalo Works. However, before the study was completed war requirements had increased to a thousand units per month. This was so far in excess of the available capacity in any of the Company's existing plants that construction of a new plant and creation of a new organization to plan and operate it was the only method by which the requisite production could be achieved.

Thus was the Aeronautical Division conceived. It was born, healthy and kicking, in November 1940 when a group of key men selected from the Company's other plants was gathered together as a nucleus for the future

organization and given the job of planning the new factory and its equipment. Before the infant division was a month old architects were at work on the building details and by the end of the year financing arrangements had been completed with the Defense Plant Corporation.

The first building contracts were awarded in January 1941. In February men started working on the site. Piles were driven and foundations were poured in March. The steel started up in April. Roofing went on in May, and the concrete floors were poured in June. In July, a few members of the Aeronautical Division staff occupied their offices in the new building and in August machine tools began operating on a production basis. September was devoted to eliminating "bugs" from production operations and on October 11, 1941, the first fourteen crank cases were given their final inspection and shipped.

Production increased rapidly thereafter but not as rapidly as war requirements. Within a few months, even before production in the first building had reached its peak, Wright was calling for more than 2500 crank cases per month and the need for more machine

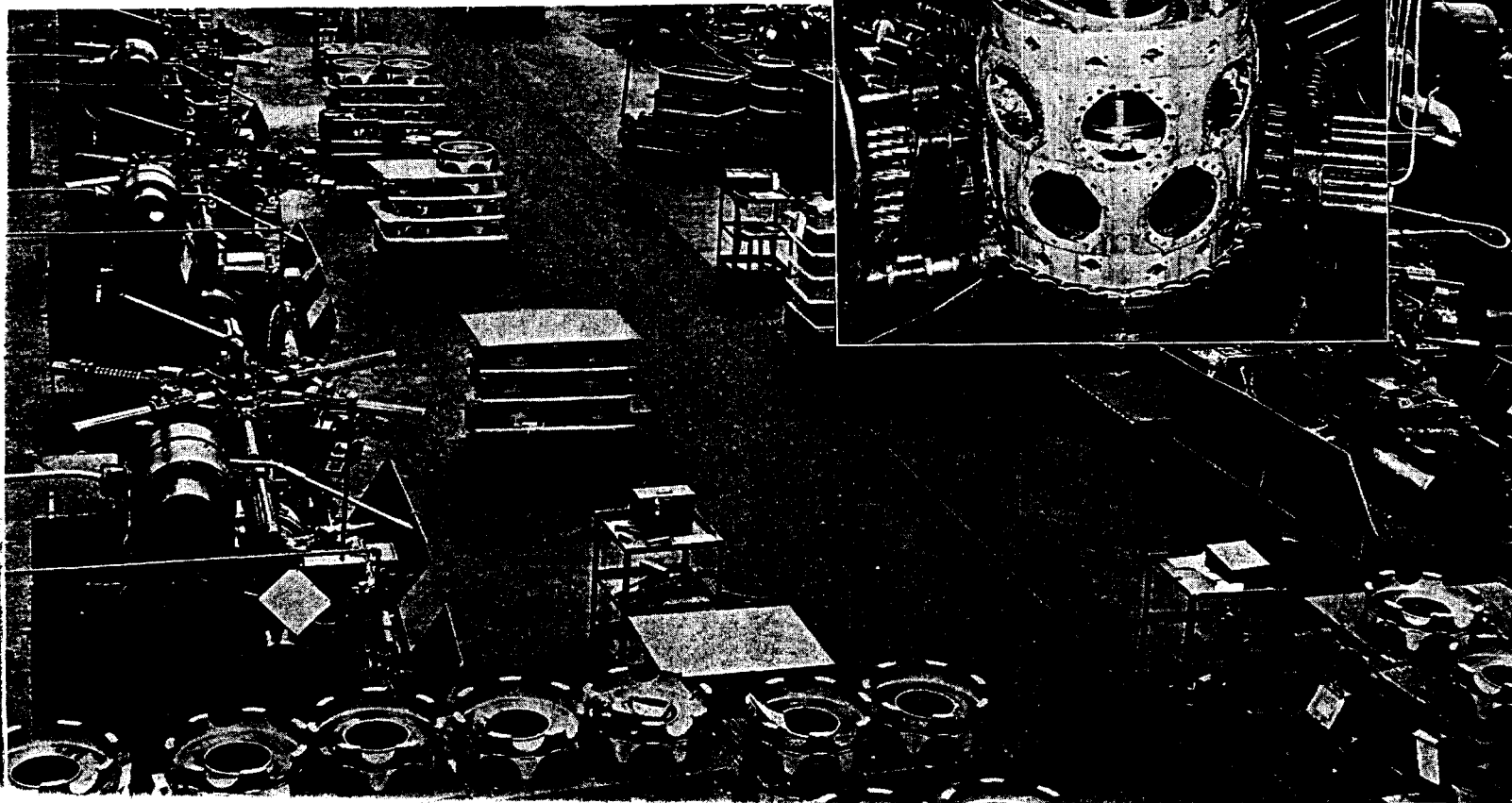
tools and an additional building had become obvious. So, the process whereby a factory comes into being was started all over again. Ground was broken for "Building Two" on May 6, 1942 and machine tools were in the new building and turning out productive work by November 16th of the same year.

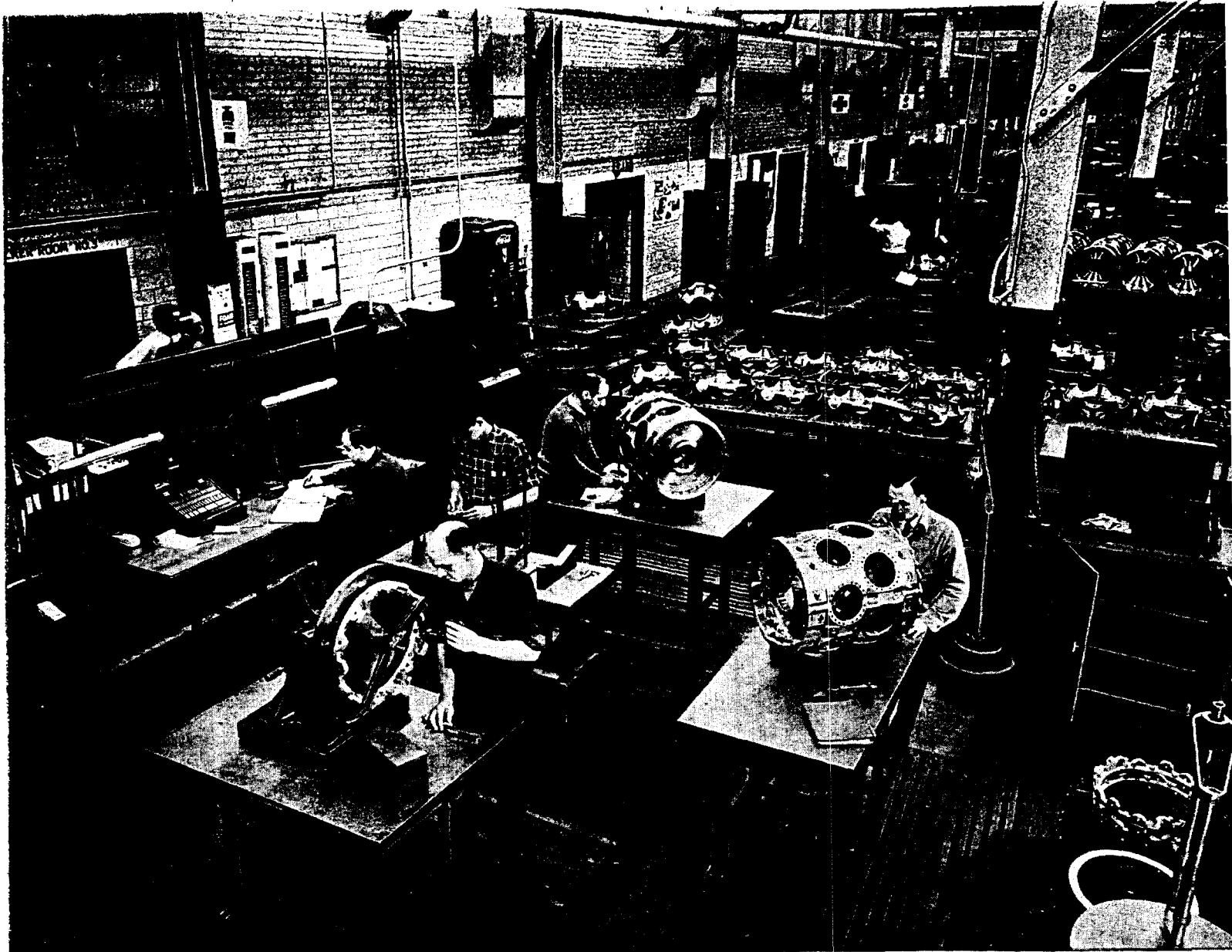
Concurrently with the occupation of Building Two, all the production lines in Building One were rearranged so that the two buildings together would operate as one integrated unit. Every machine tool in the plant had to be relocated, many had to be moved from Building One to Building Two and much new equipment had to be installed, but the entire change-over was accomplished with only three days lost production time.

Once established, production of 14-Cylinder crank cases increased steadily and would have continued to V-J Day without slackening had the increasing use of "B-29 Bombers" not created such a heavy demand for a new 18-Cylinder Cyclone engine that, in the Spring of 1944, the Aeronautical Division was requested to shift a substantial portion of its production to crank case requirements for this larger engine. New machine tools were

Close-up of a reaming and tapping operation on a 14 cylinder crank case.

Rough steel forgings ready to be fed into some of the always hungry automatic machines with which the Aeronautical Division Plant was equipped.





One of the 21 inspection stations distributed throughout the plant. As a direct result of the inspection system employed, the Aeronautical Division received and retained the "A" inspection rating of the U. S. Army Air Force.

procured on short notice and most of the existing tools were converted and relocated for this manufacture. By the end of the year straight line production of the new crank case was under way and initial shipments were made in February 1945. Monthly demands for the 14-Cylinder crank case were tapered off and delivery schedules of the 18-Cylinder rapidly increased up to the time hostilities ceased.

Many commendations and citations were received by the Aeronautical Division and its employees. For the consistently superior

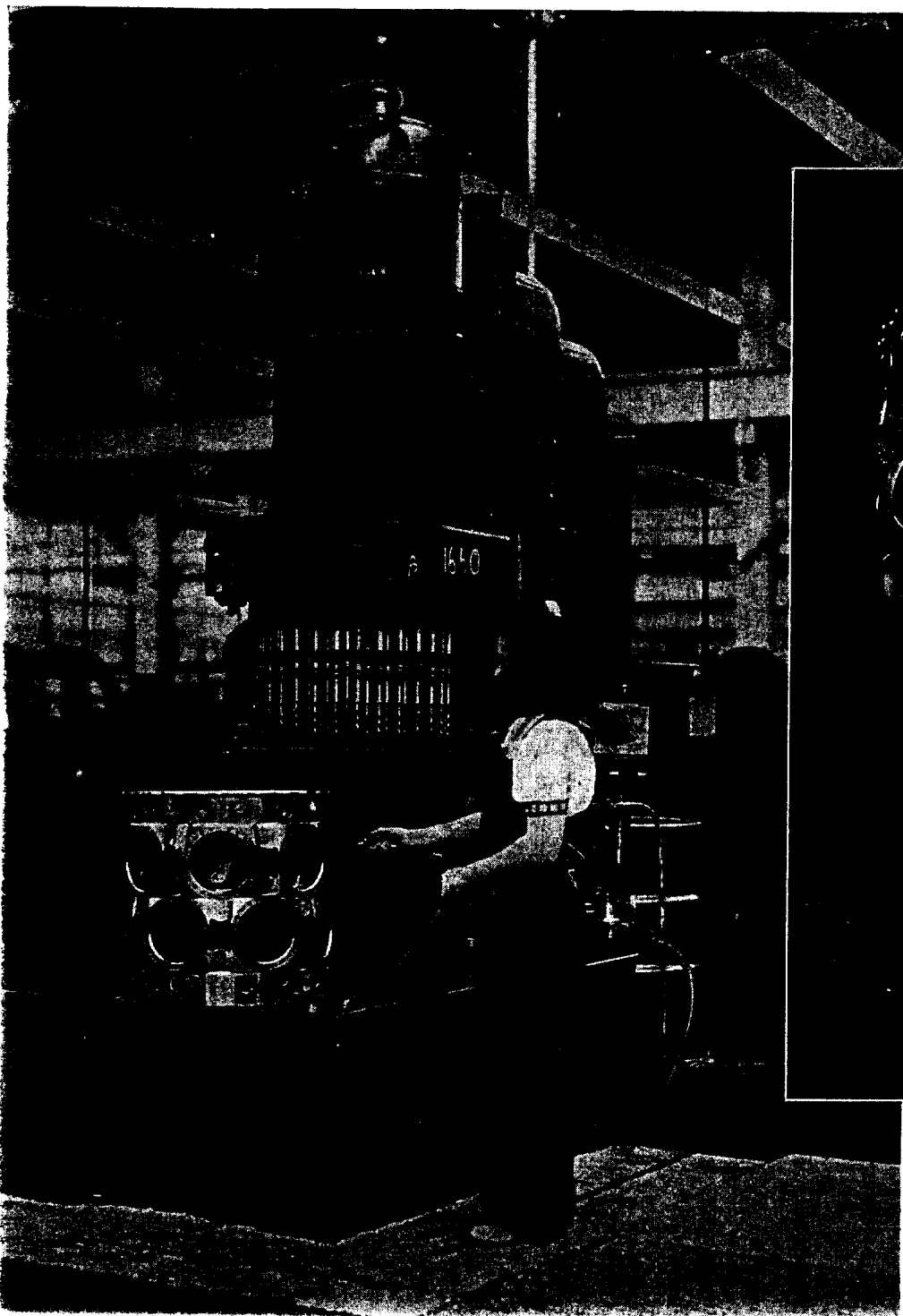
quality of product delivered, the Division maintained an "A" inspection rating which is the highest quality inspection rating awarded by the U. S. Army Air Corps. For their achievements in quality and quantity production, an Army and Navy "E" flag was awarded to the employees of the Aeronautical Division plant by the Under-Secretary of War on October 24, 1942 and for continued outstanding performance, three stars were subsequently added to this flag.

All need for the Aeronautical Division van-

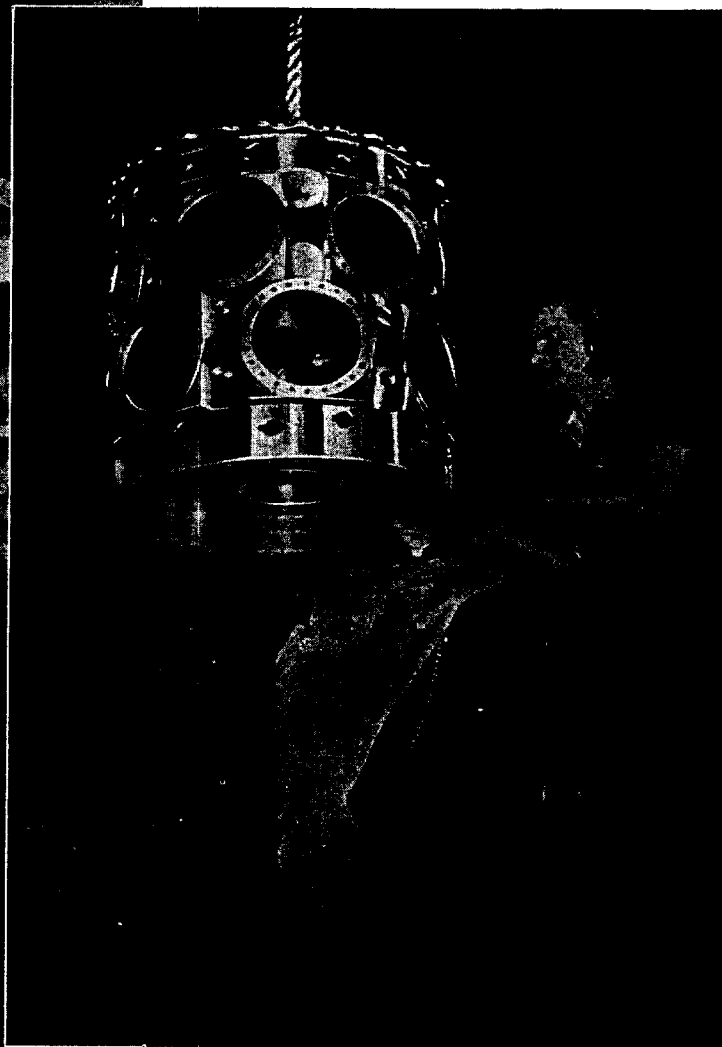
ished on August 14, 1945 when official notification was received that Japan had capitulated. The plant was shut down at 7:15 o'clock that evening and within a very few minutes the mammoth force dwindled to a small group of clerical workers in the office and a hand-

ful of men in the shop. Thus, after it had served its purpose, the Division was dissolved as rapidly as it had been created, but during its useful life of almost five years, it contributed materially to the war effort and brought honor to the name of Otis.

Air cleaning one of the 14-cylinder crank cases after drilling operations.



Greatest care was necessary in handling the highly polished machined surfaces.

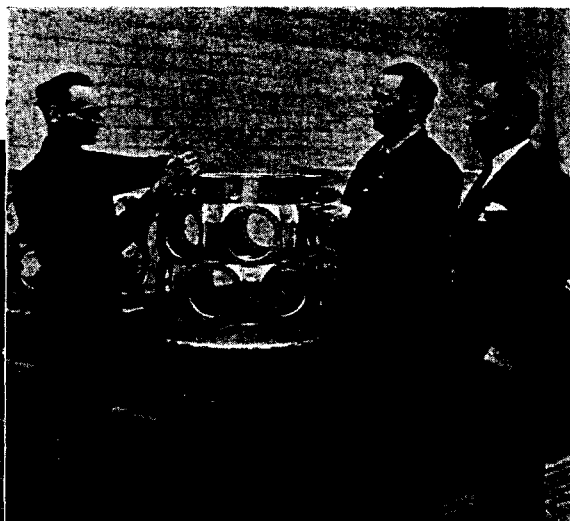


CREATION of the LABOR FORCE

Except for the executives and shop supervisors, most of whom were assembled from other Otis activities, men and women were recruited from neighboring towns and cities to form the operating force of the Aeronautical Division. Adults and minors, athletes and cripples, school boys and housewives, over-timers and part-timers—all were taken in and given an opportunity to serve. Few of these people had even rudimentary knowledge of machine-tool operation when hired but most of them became competent productive operators after completing the training courses which were established for them by the Company and the New Jersey Vocational School System.

One of the unusual features of the Aeronautical Division's personnel policy involved the utilization of blind workers wherever possible. After a short period of training, blind men and women excelled in certain types of inspection operations such as gauging threads or thicknesses or diameters. It was found that the "feel" of a gauge in the sensitive fingers of a properly trained blind inspector was a very reliable index to quality and accuracy. In addition, the cheerfulness and joyful contentment of these people were so contagious that it was a pleasure and privilege to work near them.

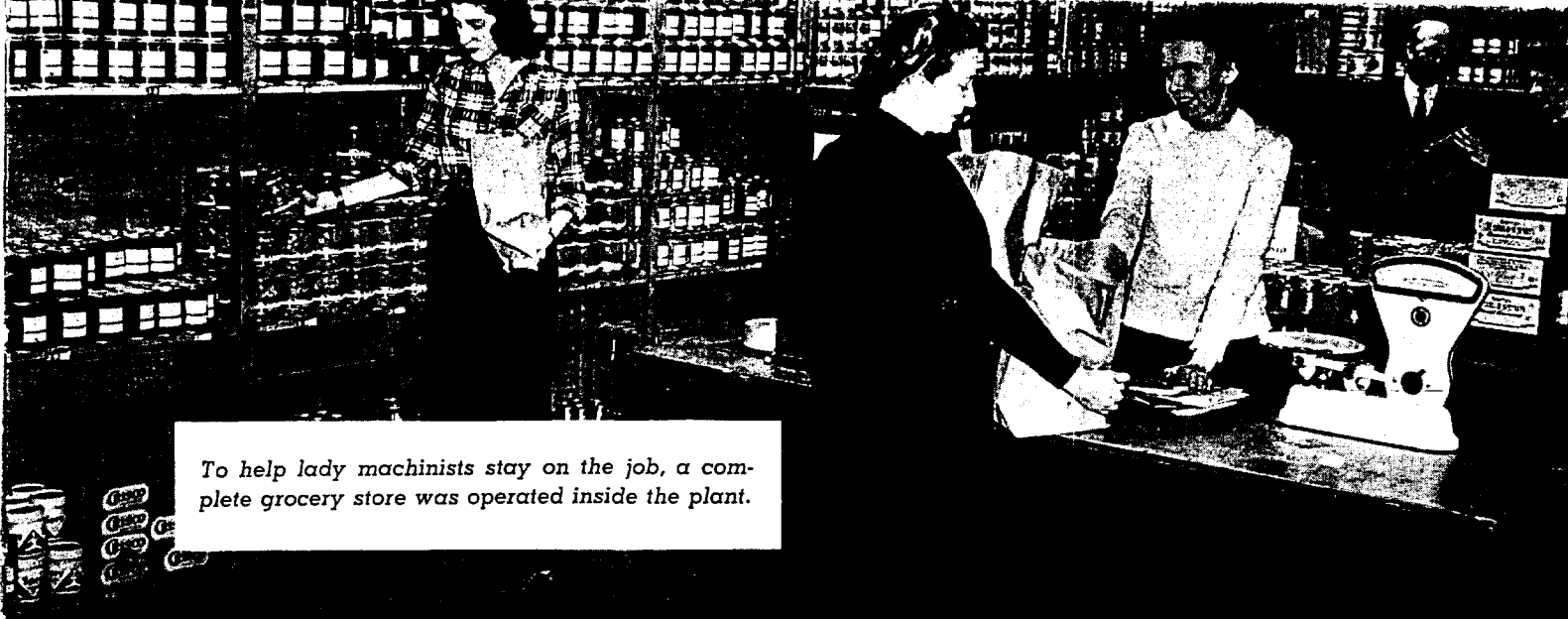
Beside their work as inspectors, the blind employees found other ways to serve. Accompanied by Army doctors, they went by groups to visit war-blinded soldiers in hospitals. For this they received many heart warming commendations attesting the morale boosts which they were able to give the sightless veterans.



Blind inspectors gauging the accuracy of threads.

View of the school production line on which machine-tool operators were trained for the Aeronautical Division.





To help lady machinists stay on the job, a complete grocery store was operated inside the plant.

EMPLOYEE WELFARE


In the field of employee welfare the Aeronautical Division inaugurated many new services not usually supplied by plant management. It is estimated that these measures by reducing absenteeism saved over 40,000 man hours per month which would otherwise have been lost to the war effort.

Since the men and women who worked long hours each day and seven days each week had little time for shopping, there were provided within the plant, two cafeterias, two barber shops, a post office and a grocery store, while just outside the entrance gate were a shoe repair shop, a filling station and a tailor shop. One day each week a local department store displayed merchandise for

sale in the plant and local government officials cooperated by providing on-the-job facilities for filing tax returns, registering for the draft, applying for ration books and obtaining automobile license plates.

A group of employees known as "The Otis Family" were recruited from within the plant to sing and play sacred music over the public address system each Sunday for those who would have attended church had they not stuck by their jobs. This group also broadcast a half-hour variety program over Radio Station WAAT every Sunday and on several occasions participated in broadcasts over the major networks. In addition, the Otis Family found time for the entertainment of military personnel, their homey show being well known in hospitals, camps and recreation centers throughout the East.

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Rolling food wagons, night and day, helped to keep both production and morale high in the Aeronautical Division shops.

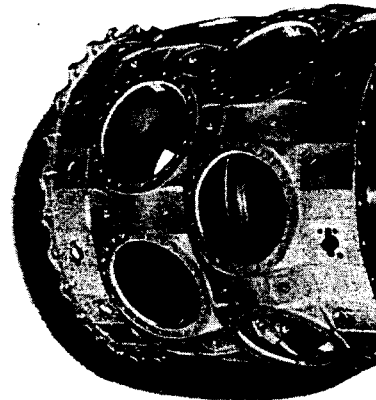
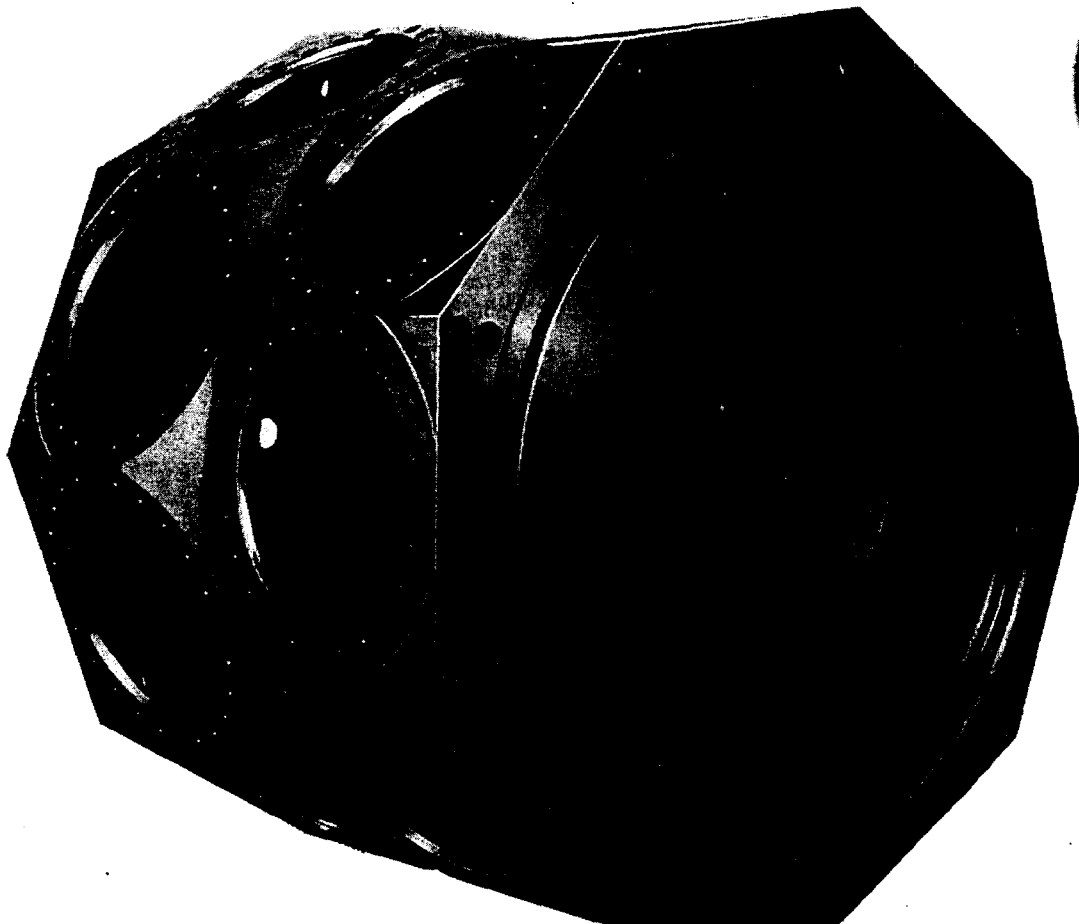
THE FINISHED PRODUCT

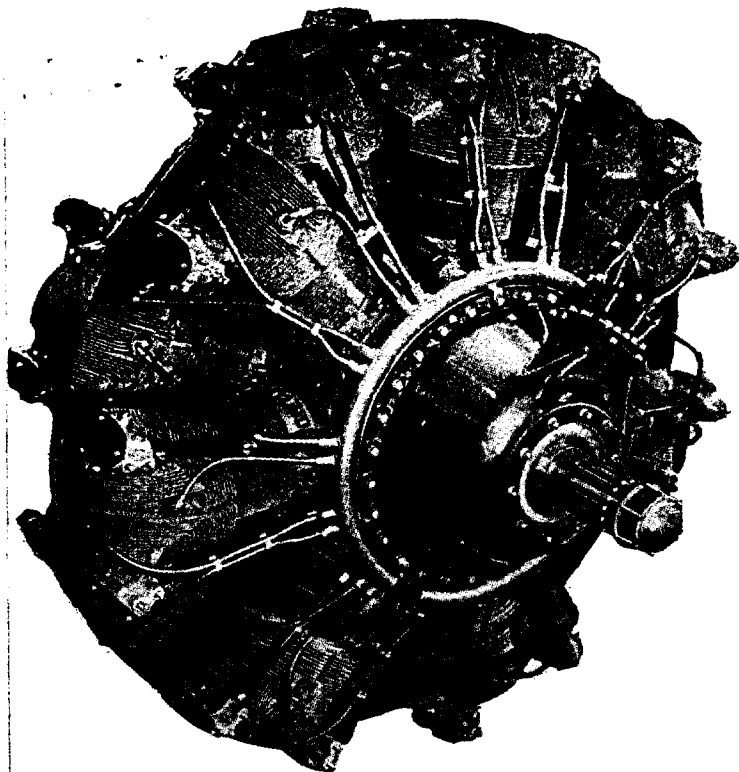
When completed and ready for a Cyclone engine to be assembled around it, each crank case looked like a huge shiny cylinder drilled full of holes. Although not complicated in appearance, both the 14-Cylinder and 18-Cylinder crank cases were difficult to produce because of the extreme accuracy with which all operations had to be performed and the close tolerance restrictions on dimensions and surfaces. Since all sections of the cases were very thin, unusual techniques had to be

devised to prevent distortion during the machining processes. To give these thin sections strength, a special alloy steel was used for the forgings from which the crank cases were made.

It required 248 machining and bench operations to reduce a 680 pound rough steel forging to a finished 210 pound crank case. Fifteen hundred inspection checks of tolerance and finish were needed to insure the accuracy demanded by the U. S. Air Force specifications.

The finished products: crank cases for 14-Cylinder and 18-Cylinder Wright Cyclone airplane engines.

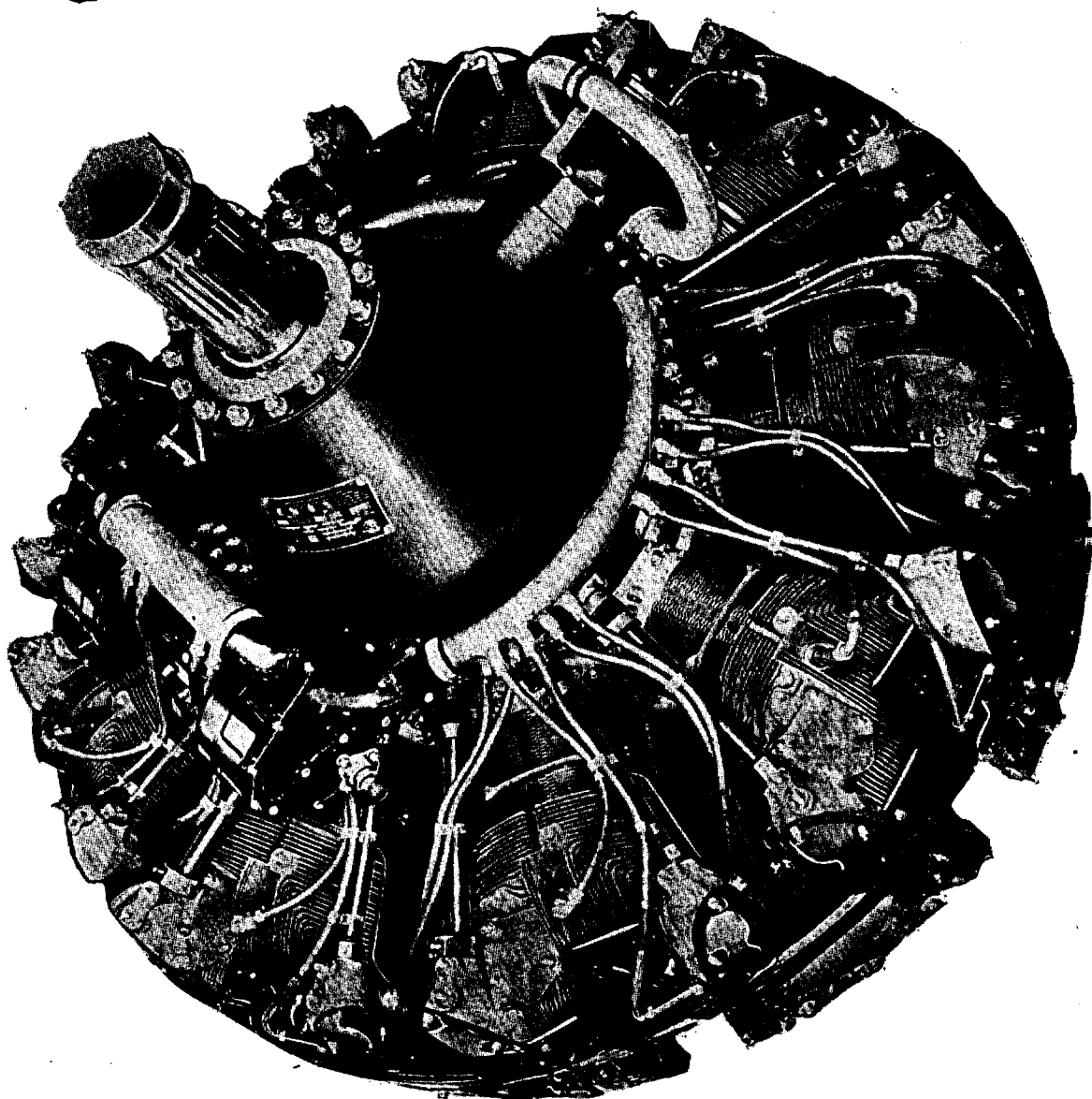




ON this page are pictured the end uses of the aircraft engine crank cases built by Otis.

Above is the 14-cylinder Cyclone engine which powered such planes as the Helldiver and the Havoc. Engines like this, equipped with Otis-built crank cases, powered the B-25 Mitchells which carried General Doolittle and his men on their first famous raid on Tokio.

Below is shown the 18-cylinder Cyclone engine. This unit, packed with the power of 2200 horses, drove the Martin Mars, the Lockheed Constellation, and the mighty Superfortress.



OTIS ELEVATOR COMPANY

INTER-OFFICE CORRESPONDENCE
Harrison Works
Aug. 14, 1929.

Zone Division,
New York.

Attention of Mr. J. C. Bebb

In accordance with our telephone conversation of to-day, we are giving you herewith some facts that you may care to use in connection with the recent request from the Newark Chamber of Commerce regarding the Harrison Plant of the Otis Elevator Company.

In 1910 the Otis Elevator Company bought the business and plant of the Marine Engine & Marine Company located at Harrison, N. J., who were engaged in the manufacture and sale of elevator apparatus.

At that time the plant consisted of a gray iron foundry, machine shop, a power house and office, the total area of which was approximately 95,000 sq. ft.

As the need for additional manufacturing facilities presented themselves the Harrison Works have been increased by the addition of several buildings, and the following table will indicate the year in which these buildings were erected and the floor areas they contain:

1910	-	28,860 sq. ft.
1913	-	90,400 sq. ft.
1916	-	26,200 sq. ft.
1920	-	18,640 sq. ft.
1923	-	12,200 sq. ft.
1924	-	12,200 sq. ft.
1926	-	16,000 sq. ft.
1928	-	116,525 sq. ft.
1929	-	13,725 sq. ft.

Total - 334,750 sq. ft.

Sheet #1.

OTIS ELEVATOR CO. ARCHIVES
RECORD GROUP - 5

OTIS ELEVATOR CO. ARCHIVES
RECORD GROUP - 5

W.C. Jones

1910-1929

OTIS ELEVATOR COMPANY

INTER-OFFICE CORRESPONDENCE

Mr. J. C. Bebb, Zone Division,
Sheet #2.
August 14, 1929.

The land area of the original sight was about 6 acres, whereas now the property area is approximately 33 acres of land improved with rail and water facilities of the best and including over 2,000 ft. of frontage on the East bank of the Passaic River.

The first payroll in 1910 covered about 90 employees, whereas to-day approximately 850 individuals are employed in the Harrison plant and this number is increasing steadily.

In the early days of the elevator industry and until comparatively recent years, the manufacturing in Harrison was confined to the hoisting machines and structural hatchway material such as the sling (including the safety mechanism), platforms, counterweights, etc., but at present not only are these items of apparatus produced but the following in addition:

- Passenger and freight cabs.
- Gates for cab and hatchway entrances.
- Doors.
- Door Hangers.
- Door and Gate Operating Devices for manual, pneumatic and electric operation.
- Escalators.
- Steam and Electric Hoists.

The manufacturing buildings are of modern construction and are now equipped with the latest types of production tools, and every attempt is made to keep informed regarding all new processing developments so that where practical they may be adopted.

It is reasonable to expect that the business of the Otis Elevator Company will continue to increase in the future as it has in the past, and therefore the Harrison plant with its available facilities for expansion should be assured a steady growth for several years to come.

Very truly yours,
HARRISON WORKS.

E. E. Campbell

MANAGER.

CCC*RB

OTIS ELEVATOR CO. ARCHIVES
RECORD GROUP 5

OTIS ELEVATOR CO. ARCHIVES
RECORD GROUP 5

1929-1929

1929-1929

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OTIS BULLETIN

July 1977

Otis Elevator Company — North American Operations

Number 567

UTC Earnings Set Half Year Record; Sales Also at High

HARTFORD, CT. — United Technologies Corporation had record earnings and sales for the second quarter and first six months of this year, according to Harry J. Gray, chairman and president.

Net income for the quarter ended June 30, 1977, amounted to \$50,077,000, equal to \$1.47 a share on the common stock, a 22 percent gain over \$41,114,000, or \$1.38 a share, for the same 1976 quarter.

On a fully diluted basis — assuming all outstanding convertible securities had been converted — earnings for the 1977 second quarter were \$1.09 a share, an 11 percent increase over 98 cents a share for the same 1976 quarter.

Sales increased to \$1,417,795,000, up 6 percent over the second quarter of 1976.

For the first half of 1977, net income amounted to \$95,800,000, equal to \$2.88 a share on

continued on page 4



First in the World... see page 7

Blackout Woes Are Lightened By Otis Service

NEW YORK — On Wednesday evening, July 13 at 9:35 P.M. New York City was blacked out by a massive power failure.

The blackout, which affected the entire metropolitan area including Westchester, was caused by a series of events that began an hour earlier when two

continued on page 2

Revised Plan Lifts NAO Salary, Pension, Insurance Benefits

NEW YORK — Robert L. Cole, President, NAO, has announced a series of increases in the salary and insurance benefits programs for all NAO management employees in the U.S. and non-exempt employees except those located with or in groups represented by bargaining units.

Harrison Plant Gets "New Look"

HARRISON, N.J. — The Otis-Harrison plant, the company's second oldest production facility, is planning to nearly double the manufacturing space that it was reduced to 18 months ago.

"Some 13 buildings of the original 25 dating from 1899 are scheduled for demolition," according to George A. Bobelis, vice president, production NAO, and chief architect of Harrison's new modification plans. "With it will come an increase in productive capacity, with total manufacturing space

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Cole said that "a sizeable increase has been made in the funds available for merit increases." Also, new salary schedules will now allow for more salary growth within each grade. Cost of living pay increases now will be included in the merit budgets rather than provided separately, and all pay increases will be based on individual performance.

Pension Plan Improvements

The formula for the Basic (non-contributory) Retirement Plan was increased from \$8.00 to \$9.50 a month per year of service. This change went into effect April 1, 1977. On April 1, 1978, the benefit again will be increased to \$10.00 a month per year of service.

Anyone who retires at age 62 with 25 years of service, or disability pensioners reaching age 65, will get full credit for all prior non-vested service. The pension benefit offset for Workers Compensation has been eliminated.

Medical Protection

Benefit maximums have been raised to \$100,000 from \$50,000 during any one year, and to \$250,000 from \$100,000 during your lifetime.

Maternity benefits have been improved, including a 50 percent increase from \$500 to \$750 for normal delivery.

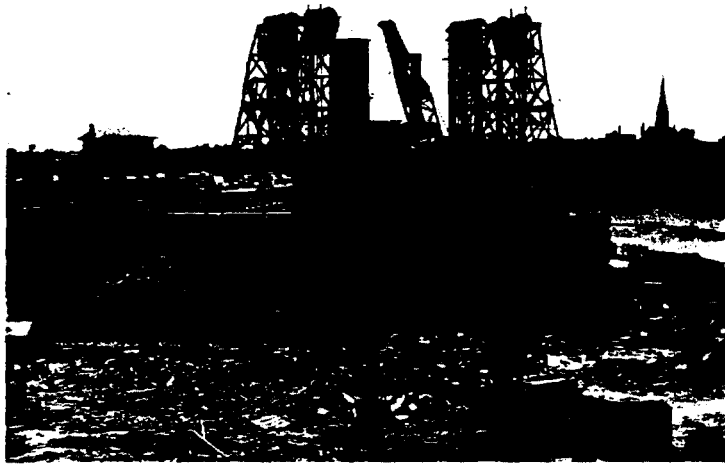
Vacations

Vacations in 1977 for employees with 30 years continuous service will be increased by one day added to five weeks they now get. Starting May 1, 1978, 30-year employees' vaca-

continued on page 4

Otis Wins \$2-Million Coke*

ATLANTA, GA. — "Have a Coke*" became an even more popular expression in the South Eastern Region recently when Otis was awarded a \$2.2-million contract by the Coca-Cola Company for elevators in its new 26-story international headquarters office tower here. The building will have a low-and mid-rise group of five units each, plus a high-rise group of four passenger and two service elevators. Coca-Cola plans to occupy the building by September, 1978. *Coke is a registered Trademark of the Coca Cola Co.



COMING DOWN. Remains of several of the Otis-Harrison plant's Buildings. Thirteen of the original 25 buildings will be torn down as part of a complete renovation of the entire facility.

Harrison

continued from page 1

scheduled to be over 364,000 square feet. It will be a first class manufacturing facility." Bobelis said.

James Van Bramer, Harrison plant manager, says that total employment will be increased by more than 100 people from its present 260. "Almost all of the increase," Van Bramer added, "will be recalled from a group of former employees."

Reason for the renovation of the Harrison plant, according to Robert L. Cole, NAO president, "Is to re-establish it as Otis' architectural product center. With its high quality and efficiency of operation at a minimum cost, it will help Otis recapture its share of the elevator cab market."

Presently, Harrison manufactures special cabs, entrances, rails, and Group V products (mainly car and hall fixtures). When modification plans are completed, Harrison will be making all frames, expanding cab manufacturing facilities to include geared-elevator cabs, and producing the components needed in the manufacture of the Group V products.

In addition, an NAO service complex will be added to the Harrison Plant. This unit will include the present Works Service Department in Yonkers, and the Service and Construction Administrator and his staff now located in Yonkers, in addition to a new Division Service Shop that will manufacture all service parts.

According to Bobelis, this service complex will permit a substantial improvement in the deliveries of service parts to customers. At present, 30,000

square feet of space has been allocated for service-parts manufacture, with future expansion possible. The Administrator group will determine where any order will be manufactured — Harrison, Yonkers, Bloomington — and then will monitor all orders, emphasizing control and scheduling.

According to Van Bramer, "The plant rearrangements scheduled during the next 12 months will allow us to manufacture at a rate more than double the per cent of forecasted increases in volume."

Other physical changes in the Harrison plant site will be the sale of the present eight-acre parking lot, and the relocation of the parking lot to where buildings are now being demolished. Near the main entrance, where most of the buildings are being torn down, about four acres will be landscaped to include trees and benches. In addition, a special exterior beautification design of Harrison plant's buildings is planned.

TTD Gets Add-On To Duke 'People Mover'

DURHAM, N.C. — NAO's Transportation Technology Division has been awarded an addition to its original \$5-million contract with Duke University here to install an automated "people mover" transportation system linking the University's medical center hospitals. No dollar figure was announced.

Larry Saunders, general manager of TTD, said the new work "will add 700 feet of guideway and one additional air-cushioned vehicle" to the system.

VIEWPOINT

(Editors Note: From time to time, the Bulletin will publish articles by members of North American Operations' management, covering a variety of topics of interest to all employees. The first one appears below.)

Managing Success And Change



Robert L. Cole
NAO President

One of the two greatest challenges that any management organization faces is managing **SUCCESS**. When you have been number one for almost 125 years, as Otis has, the job is even more difficult and challenging. The second major challenge is learning to live with and benefit from **CHANGE**.

The problem with success is that it can lead to self-satisfaction, complacency, a less than urgent attitude about solving business problems, and to the belief that anything you do — including nothing — will turn out all right. This is dangerous in any business, but it is especially dangerous in a business like ours where there are almost 400 competitors. We must constantly be on guard to make certain that success does not become our enemy.

The free enterprise system and the competition that is inherent in it have made our country the greatest in the world, and have produced the high standard of living we all enjoy. However, to survive in this competitive economic environment requires a strong, competent, aggressive organization. We all work in an economic jungle, so to speak, and if we are not strong, we lose. The Darwinian principle of "survival of the fittest" applies in business just as it does in nature.

It is said that "the only thing that is constant is change." There is nothing, absolutely nothing, in the entire universe that is not undergoing some form of change during every second of every day. Nevertheless, adapting to change continues to be one of the most difficult phenomena we face.

"The good old days" is a phrase we have all used at one time or another. It may represent our personal dissatisfaction with the present when compared with the past — the implication being that the past was better before it was "changed" to the present. The fact is that **nothing** is static, everything changes constantly.

Resistance, distrust or dissatisfaction with change, whether it concerns office locations, business systems or people, is common to business changes as well as with those changes that affect our personal lives. Further, when the rate of change increases it becomes even more difficult to handle.

Change is dynamic, inevitable and should be viewed as progressive, not regressive or onerous. I don't believe in change for the sake of change; however, businesses that do not adapt or change in a rapidly shifting business environment find themselves falling behind more adaptive competitors.

I assure each and every one of you that your management is aware of the challenge of managing success and change, and that with your understanding, support, and vigor Otis will continue to be number one for the next 125 years as well.

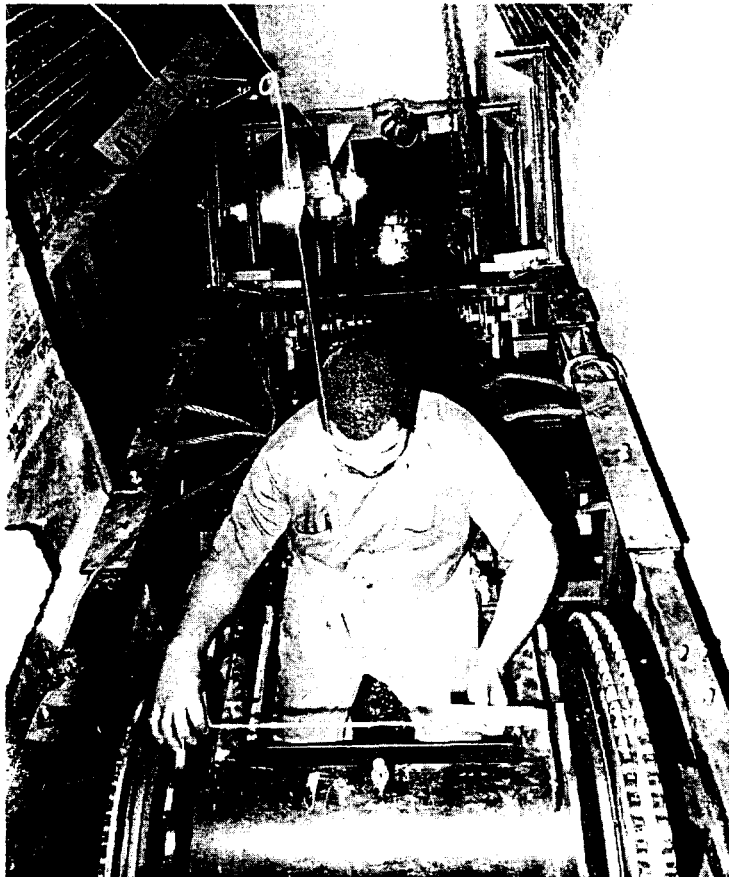
OTIS BULLETIN

September 1980

Otis Elevator Company — North American Operations

Number 600

Manhattan Modernization



Otis' John Moody checks alignment of escalator in N.Y. Port Authority Midtown Bus Terminal, where Otis is installing 53 units under a \$3.6 million modernization contract. Otis also won a 25-year OM service contract for the equipment.

Otis Employees Offered Savings On UTC Products

HARTFORD — Otis employees can purchase consumer products made by United Technologies units at significant savings under a plan that took effect July 1. All full-time Otis employees based in the U.S. and Canada are eligible to participate.

Retirement Plan Is Improved By Pension Panel

FARMINGTON — A significantly improved Otis Retirement Plan — replacing the Basic and Supplemental plans for salaried, non-represented, U.S.-based employees — has been approved by the Pension

Products available for purchase under the plan include Carrier air conditioning and heating equipment, Jenn-Air ranges and ovens, and Essex audio components, electric blankets and heating pads. Several Bryant, Day & Night and Payne products are also covered.

Products manufactured by Essex will be ordered directly from the plant, which will ship the product to an

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Major Service Pacts Lead NAO Contracts

FARMINGTON — Significant service-maintenance and modernization awards from San Francisco to Boston — including a 25-year, extended OM agreement with the University of Notre Dame — top a list of recently-awarded major NAO contracts with a combined value of several million dollars.

Four Awarded Otis-Canada Scholarships

HAMILTON, Ont. — Otis Elevator Company Limited President George H. Blumenauer has announced the winners of the 1980 Otis-Canada College Scholarship awards.

In marking the first year of the United Technologies Corporation-sponsored program for the benefit of children of Otis-Canada employees, four high-school seniors have been awarded \$1,000 for tuition and academic fees for each of the three or four years of full-time study leading to a bachelor's degree.

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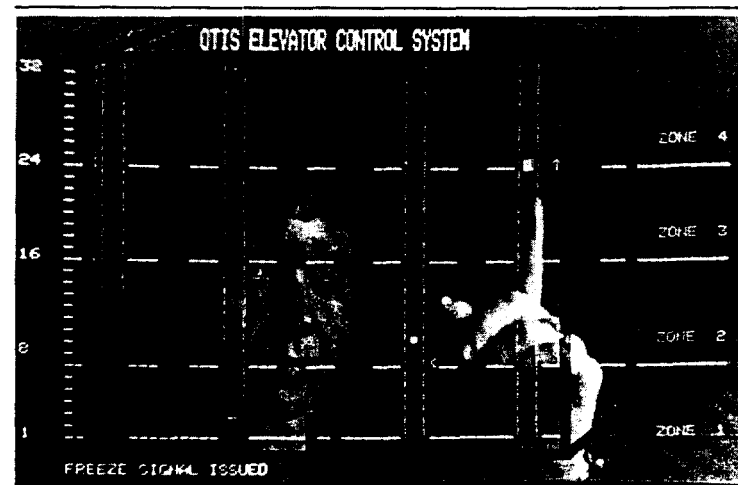
In San Francisco, Service Sales Representative David Reed has negotiated a significant earthquake modernization contract for 525 Market Street — where the main tenant is Wells Fargo — covering 22 Otis elevators.

continued on page 5

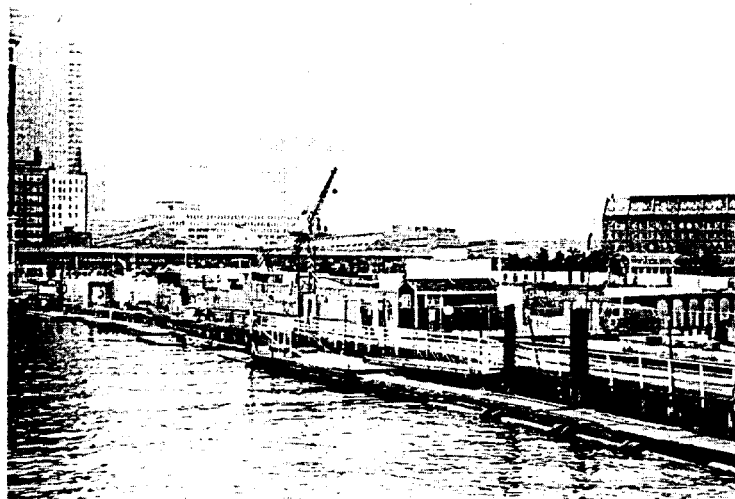
Otis Announces September Close Of Harrison Plant

HARRISON, N.J. — NAO President Robert L. Cole has announced the closing of the company's Harrison Plant, effective September 1. Cole said the decision was made with great regret, but that it was necessary to "insure Otis"

continued on page 2



PHANTOM OF THE ELEVATOR? This ghostly image is actually the reflection of Sue Sonenstein (Industrial Relations) on the video screen of a computer simulator in the R&D Center. Used in the testing of the Elevonic 101 microcomputer control system, the simulator traces passenger traffic patterns in a high-rise tower model. Black and white squares on screen record elevator movement in response to continual changes in building's traffic flow.



BOSTON WATERFRONT CONSTRUCTION — Recent photo shows construction startup of the new \$30-million, 395-room Marriott Long Wharf Hotel in Boston. Developed by Boston Properties, Inc., the New Atlantic Avenue project will overlook the Charles River and utilize six Otis elevators and two ESCAL-AIRE® escalators.

Gibson Joins Regional Division As Code Director

FARMINGTON — George W. Gibson, formerly manager of mechanical systems, engineering division, has joined the regional division as Director of Codes — NAO, a new position.

In making the announcement, Vice President of Regional Operations William O. McCallum said Gibson would report to Joseph T. Burkhalter, director of sales engineering, and will be located in the Research and Develop-

ment Center here.

In his new position, Gibson is responsible for providing effective direction, technical planning, administration and control of all Elevator Safety Codes and Standards activities in NAO to ensure maximum coordination and effectiveness and to integrate the NAO

continued on page 6

UTC Products

continued from page 1

employee's home. These items, which include speaker systems, electrical blankets and heating pads, will be offered from time to time rather than on a continuous basis.

Harrison Plant

continued from page 1

ability to remain competitive." He cited manufacturing overcapacity, and the sharp downturn in the nation's economy—which has had a major impact on the construction industry—as primary reasons for the plant closing, and added that the decision had been delayed for several years.

"In 1976, we were forced to significantly reduce the Harrison workforce because of low business levels," Cole pointed out. "We considered closing it then, but decided to make every effort to keep it open in the hope of an upturn in production levels. Unfortunately, our Harrison facility has been operating substantially below capacity."

Savings on individual items will vary but are expected to be anywhere from 20 to 40 percent off the retail price. To qualify for a rebate, the products must be purchased for an employee's personal use.

To take advantage of rebates on Carrier products, employees should purchase the selected product from an authorized dealer, then apply for a rebate through their local Purchase Plan Coordinator. Applications should be submitted within 30 days of purchase.

Since 1976, the plant's 170 employees have primarily been charged with the production of special architectural products, such as glass observation elevator cabs.

Cole said that the Harrison shutdown would result in a manufacturing cost reduction and place greater emphasis on the workforce capabilities and manufacturing operations of the Yonkers, Bloomington and Hamilton plants.

Mahwah Staff Relocating To Yonkers Plant

MAHWAH, N.J. — Otis has announced the relocation of its contract engineering staff from leased facilities here to new quarters in the Yonkers Plant in mid November.

Approximately 240 engineers, support and administrative personnel will be affected by the move.

Otis Vice President of Operations, George C. Tweed, said the relocation is being made for more efficient operation. "The move," Tweed said, "will bring the engineering group into closer daily contact with our manufacturing operations, with which it is involved, and, at the same time, will utilize available space in our Yonkers Plant rather than leased space."

Tweed said production operations at the Yonkers Plant will not be affected by the relocation.

New '101' Advertisement

This two-page advertisement, featuring Otis' microcomputer elevator control system — Elevonic 101 — will appear in upcoming editions of national trade magazines such as Architectural Record, Progressive Architecture, Building Design & Construction, Buildings, Engineering News-Record, Multi-Housing News, Professional Builder, and Elevator World.



The New Otis Elevonic 101 elevator system delivers fast, efficient, reliable performance and can save 30 percent in energy costs.

The Otis Elevonic 101 system gives a faster, safer, more efficient, reliable and comfortable elevator ride. And, it can reduce energy costs by as much as 30 percent. It's the result of three years of elevonics® engineering. Easily reprogrammable software-based microcomputers control all elevator operations—velocity, position, direction, car assignment, travel and waiting time, door operation, energy use and system diagnostics. As a result, average waiting time can be as much as one-third less than on your best previous equipment. Car hoistway position is measured to .1" and is continuously adjusted electronically. A silicon-controlled rectifier (SCR) system, used to convert AC to DC to drive the hoisting machine, uses up to 30 percent less energy than a motor-generator set. Installation time can be reduced by as much as 20 percent because system testing and line tuning is done before shipment to a job site. Maintenance also is reduced by standardized computer components, multiplex wiring, modular circuit board design, and self-adjusting features.

If you want to learn how the Otis Elevonic 101 system can fit your next building project, call your local Otis office, or write for our booklet "Everything You Wanted To Know About Microcomputer Elevator Control Systems. But Were Afraid To Ask." Send your request on your letterhead to Otis Elevator Company, Dept. 520 One Farm Springs, Farmington, CT 06032.

†Elevonics is a trademark of Otis Elevator Company. The use of advanced microcomputer and microprocessor technology in the Otis Elevonic 101 system is a significant advance in elevator technology.

UNITED TECHNOLOGIES OTIS ELEVATOR

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KEARNY, N. J.
OBSERVER
(NEWARK-NYC MARKET AREA)
W. 21,000

MAY 15 1980

Otis Corp. FRONT PAGE Closing In Harrison

✓ 7111
Otis Elevator Corp. in Harrison notified more than half of its staff that Monday was its last day. Employees had been notified late last week.

The move came as a surprise to the employees and most observers.

Of the two hundred workers at the plant, it is estimated only 85 to 90 will remain to clear out unfinished orders. Then the plant is expected to be terminated.

According to one worker, most employees asked each other "what happened" when they receive their notices.

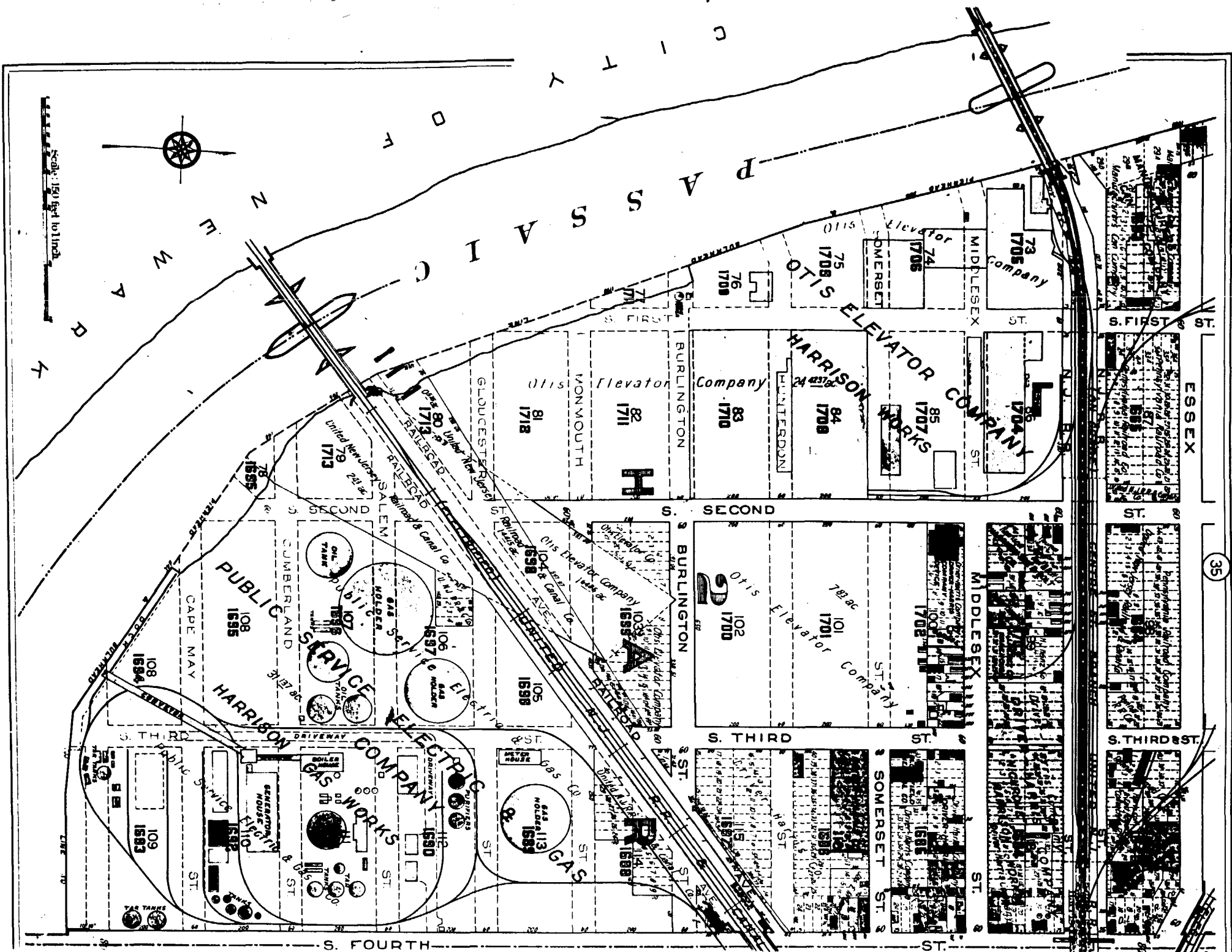
James Turner, president of Local 490, said, "Everybody was caught by surprise."

Plant officials could not be reached for an explanation or comment on the sudden action. It is believed a current slump in construction has caused the drastic reductions.

Otis at one time had 1,200 employees on the payroll. In recent years the numbers have been cut as construction has suffered. Otis was bought out several years ago by United Technology and most workers felt a bit more secure.

The latest cuts, however, came as a complete shock to plant workers. /

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MANUFACTURING FACILITIES HARRISON WORKS
METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

TOOL NO.	DEPT.	MAKE	DESCRIPTION
<u>Bending Machines</u>			
3-635	15	Kerlin Duplex Bender	Size D3
<u>Brake Presses</u>			
3-458	21	Hand Brake	Capacity 8'-1" x 26 Ga.
3-644	15	#204 Chicago Brake Press	Capacity 10' x 10 Ga.
3-653	10	#50-8 Rafter	Capacity 8' x 3/16"
3-703	10	#72 Chicago D & K	Capacity 6'-1" x 10 Ga.
3-714	10	#708 Cincinnati	Capacity 8' x 1/4"
3-730	10	#120-8 Cincinnati	Capacity 8' x 3/8"
3-989	10	#50-8 Ferracute	Capacity 90 Tons
3-1119	10	#130 Cincinnati	Capacity 10'-250 Ton
3-1186	10	#808D Chicago	Capacity 400 Tons
3-1187	15	#608D Chicago	Capacity 200 Tons
3-1188	15	#608D Chicago	Capacity 200 Tons
3-1194	10	#808D Chicago	Capacity 400 Tons
3-1195	15	#608D Chicago	Capacity 200 Tons
3-1196	10	#808 Chicago	Capacity 400 Tons
27014	10	#2 Hosfeld Hand Bender	
<u>Bolt Cutters</u>			
9-548	18	Landis	1-1/2" Triple Head Bolt Cutter
3-1152	15	Landis	1-1/2" Triple Head Bolt Cutter
<u>Boring & Turning Machines</u>			
3-926	13	King-Vertical	Capacity 96"
3-219	13	Niles-Horizontal	
<u>Broaching Machines</u>			
3-631	13	La-Pointe #3 Horizontal	
<u>Bull Dozer</u>			
3-1151	19	Farquhar Bull Dozer	250 Ton Horizontal
<u>Centering Machine</u>			
3-709	13	Part & Whitney	

MANUFACTURING FACILITIES HARRISON WORKS
METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Crusher</u>			
3-1111	19	American Conv.	Chip Crusher
<u>Cutting & Stencil Machines</u>			
1-1244	4W	Watson Cutoff Mach.	
1-404	4A	Bliss Wire Rope Cutoff Mach.	
28352	6	Diagraph-Bradley	7/8" Stencil Cutter
G-28328	6	Diagraph-Bradley	1-1/4" Stencil Cutter
33074	33	Diagraph-Bradley	1/2" Stencil Cutter
31017	6	Diagraph-Bradley	Stencil Cutter
34544	6	Diagraph-Bradley	1/2" Stencil Cutter
<u>Radial Drills</u>			
3-651	10A	American	3'
33-450	10	American	3'
1-1708	15	American	4'
1-1787	15	American	4'
3-962	18	American	4'
3-1074	18	American	4'
3-1316	13	American	3'
3-1368	13	American	4'
3-1369	13	American	4'
1-3056	15	American	4'
1-3057	19	American	4'
1-2535	13	American	5'
3-722	15	American	5'
33-568	13	Cincinnati	6'
3-1363	13	American	6'
3-1364	13	American	6'
3-1365	18	American	4'
3-1063	18	American	4'
3-1366	13	American	4'
3-1720	19	American	3'
3-1721	19	American	3'
<u>Sensitive Drills</u>			
3-571	19	Otis	Thimble Rod Drill Press
3-1094	18	Leland Gifford	4 Spindle
3-1134	24	Atlas #63	Single Spindle Bench
3-858	18	Allen	Single Spindle
3-688		Foote Burt	Single Spindle Bench
3-655	10	Van Dom	Special Bench Drill
3-639	10	Sipp-Type BW-1	Single Spindle
3-768	15	Sipp-Type BW-1	2 Spindle
3-713	10	#8 Moline	Multi-Spindle (16)
3-710	18	Sipp BW	2 Spindle
3-689	15	Foote Burt	2 Spindle
3-769	21	Foote Burt	Single Spindle
3-857	24A	Allen	2 Spindle

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MANUFACTURING FACILITIES HARRISON WORKS

METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Sensitive Drills (Cont'd)</u>			
3-815	18	Avey #2	Single Spindle
3-883	10	Avey #2	2 Spindle
3-860	15	Allen	3 Spindle
3-884	10	Avey	2 Spindle
3-896	24B	Avey	2 Spindle
3-960	13	Providence K4C	4 Spindle
3-961	13	Providence K4C	4 Spindle
3-1004		Delta	1 Spindle
3-1075	18	Fosdick	4 Spindle
3-1084	18	Fosdick	4 Spindle
3-1085	18	Fosdick	4 Spindle
3-1086	18	Fosdick	4 Spindle
3-1088	18	Fosdick	4 Spindle
3-1087	18	Fosdick	4 Spindle
3-1137	10	Walker Turner	Bench Drill
3-1138	10	Atlas	Bench Drill
3-1139	15	Atlas #63	Bench Drill
3-1141	10	Atlas #63	Bench Drill
3-1060	10	Walker Turner	
3-767	18	Foote Burt BW	2 Spindle
3-1142	10	Atlas	Bench Drill
3-1143	10	Atlas	Bench Drill
3-1144	15	Atlas #63	Bench Drill
3-1145	10	Atlas	Bench Drill
3-1146	10	Atlas	Bench Drill
3-1157	10	Fosdick #4BM	4 Spindle
3-1159	10	Fosdick #4BM	4 Spindle
3-1165	10	Fosdick #4BM	4 Spindle
3-1167	10	Fosdick #4BM	4 Spindle
3-1169	10	Fosdick #4BM	4 Spindle
3-1170	10	Fosdick #4BM	4 Spindle
3-1171	10	Fosdick #4BM	4 Spindle
3-1175	10	Fosdick #4BM	4 Spindle
3-1177	10	Fosdick #4BM	4 Spindle
3-1264	18	Fosdick #5BMA	4 Spindle
3-1320	24	Providence H2V	2 Spindle
3-1140	24A	Atlas #63	Single Spindle Bench
3-1735	7	Delta	Single Spindle Bench

Upright Drills

3-728	9	Foote Burt	
3-1092	18	Canedy Otto	
3-1091	18	Barnes	
3-1105	19	Cincinnati Bickford	24"
3-1514	15	Cincinnati Bickford	24"

MANUFACTURING FACILITIES HARRISON WORKS

METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Embossing Machines</u>			
3-929	10	Roover Embossing Press	
33041Y	15	Roover Embossing Press	
33092	10	Mathew Embossing Press	
<u>Furnaces</u>			
3-55	13	Babbitt Furnace Pot	
9-528	19	S.C. & H. #1002 Oven Furnace	Used for Drop Hammer
32708	19	Surface #534 Combustion Furnace	
32709	19	Surface #536 Combustion Furnace	
<u>Gear Cutting Machines</u>			
3-922	18	Automatic Rack Cutter	
3-1110	18	Whitton Gear Cutter	For Machining Racks
<u>Grinding Machines - Production</u>			
3-1153	10	Porter Cable #C6	
3-1164	15	Porter Cable #C6	
3-1197	18	Hammond	
<u>Grinding Machines-Floor Stand</u>			
3-999	24	B & D #83B	Floor Stand
3-615	18	U. S. 500-5UG	Floor Stand
3-621	15	U. S.	Floor Stand
3-737	18	Gardner #4	Floor Stand
3-748	10	B & D Heavy Duty	Floor Stand
3-911	24	B & S #2	Surface Grinder
3-913	24A	Van Dorn 6"	Floor Stand
3-1019	24	U. S.	Floor Stand 14" Wheel
3-1033	19	U. S. 500-3UG	Floor Stand
3-1034	13	U. S. 500	Floor Stand
3-1044	18	U. S. 500-5UG	Floor Stand
3-1108	19	Vonnegot Marschke	Floor Stand 14" Wheel
3-1109	19	Vonnegot Marschke	Floor Stand 10" Wheel
3-1120	18	B & D Tool Grinder	With Pedestal 10" Wheel
3-1121	18	B & D Tool Grinder	With Pedestal 10" Wheel
3-1122	18	B & D Tool Grinder	With Pedestal Type "F" 8" Wheel
3-1124	10	B & D	With Pedestal 10" Wheel
3-1125	19	Van Dorn	6" Wheel
3-1126	13	Cadet Tool Grinder	With Stand
3-1252	15	Hammond	10" Wheel
3-1253	13	Hammond	10" Wheel
3-1197	18	Hammond Polishing Lathe VH-6D	6" Wheel
3-1730	10	Sellers #1G	1/2" Cap. Drill Grinder
3-1047	15	U. S. #500	

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MANUFACTURING FACILITIES HARRISON WORKS
METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Grinding Machines-Bench</u>			
3-1123	10	B & D	6" Wheel
3-1719	10	U. S. Elec. Co.	8" Wheel
3-976	10	B & D	Heavy Duty 6" Wheel
3-1127	24B	B & D	6" Wheel
<u>Hammers</u>			
3-1043	15	B & W Drop Hammer	
<u>Heaters</u>			
22138	15	Berwick Rivet Heater	Portable
26498	15	#2ACF Rivet Heater	Portable
24076	15	Berwick #2 Rivet Heater	
32071	19	Berwick #3 Rivet Heater	
<u>Iron Workers</u>			
3-763	15	Buffalo	#3-1/2
3-1704	15	Buffalo	#2-1/2
<u>Keyseater</u>			
3-620	13	Baker Brothers	#2
<u>Engine Lathes</u>			
3-850	24	Reed & Prentice	14" x 6'
3-608	24	L & S	18" x 10'
3-609	13	L & S	18" x 10'
3-74	13	Putnam	24" x 8'-6"
3-486	13	L & S	24" x 22'
3-873	18	Prentice	14" x 6'
3-1288	13	LeBlond	18" x 78"
8-111	13	Fitchburg	64" x 10'
<u>Turret Lathes</u>			
3-696	18	Warner & Swasey	#4
3-757	13	Bullard	54" Vertical
3-968	13	Jones & Lamson	#8B 36"
3-1212	13	Bullard	42" Vertical
3-1096	13	Jones & Lamson	#8A
3-1073	13	Warner & Swasey	#3
3-1068	18	Warner & Swasey	#3
3-1069	18	Warner & Swasey	#3
1-3033	13	Bullard	36" Vertical

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MANUFACTURING FACILITIES HARRISON WORKS
METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Chuckling Lathes</u>			
3-915	18	Potter & Johnston	#2-6A Auto.
3-921	18	Potter & Johnston	#4D-6A Auto.
3-974	18	Potter & Johnston	#2-6A Auto.
3-980	13	Gisholt	#3AL
3-863	18	DeGoss & DeLew	4 Spindle Auto.
<u>Measuring Machines</u>			
3-1114	4W	Wire Measuring Mach.	
1-2382	4W	Measuring & Cutoff Mach.	
1-2484	4W	Measuring Machine	
<u>Milling Machines-Duplex</u>			
33-298	10	Van Norman	#3
9-614	13	Cincinnati	#4-48" Hydromatic
<u>Milling Machines Horizontal & Vertical</u>			
3-854	10	Whitney Horizontal	#6 Hand Operated 20" x 4" Table
1-1989	13	K & T Horizontal	#3B
3-971	13	Cincinnati Horizontal	#4
1-1576	18	Cincinnati Horizontal	#4
33-581	18	Cincinnati Horizontal	#4
3-1067	10	Nichols Hand Miller	
3-1514	13	Milwaukee Horizontal	#4K
3-1513	18	Milwaukee Horizontal	#4K
3-633	13	Cincinnati Horizontal	#5 High Power
3-1292	18	Milwaukee Horizontal	#2
3-1406	10	Milwaukee Horizontal	#4
3-1407	18	Milwaukee Horizontal	#4
3-1401	13	Milwaukee Horizontal	#5
3-1402	13	Milwaukee Horizontal	#5
3-1014	13	Ingersoll	Type A - 4 Head
3-1015	13	Ingersoll	Type A - 4 Head
3-221	13	Ingersoll Vertical	#2
1-1566	13	Newton Rotary	#48
3-1234	13	Milwaukee Vertical	#4K
3-1235	13	Milwaukee Vertical	#4K
3-1093	24	Van Norman Univ.	#12
3-1173	10	K & T Horizontal	#3K
3-1174	10	K & T Horizontal	#3K
1-1576	18	Cincinnati Horizontal	#4 High Power
3-1729	19	Cincinnati Horizontal Spec. Rail Mill & Drill	
<u>Oxygraph Machine</u>			
26720	15	Airco Flame Cutter	#6A

MANUFACTURING FACILITIES HARRISON WORKS
METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Paint Conditioner</u>			
32824	10	Red Devil Paint Conditioner	#33
<u>Planing Machines-Metal</u>			
3-41	13	Bond	49"x49"x16' 2 Vert. 1 Horiz. Hds.
3-354	13	Niles	97"x110"x16' 2 Vert. 2 Horiz. Hds.
9-479	19	Gray	67'x56"x20' w/4 Magnetic Chucks
9-623	19	Cincinnati	73"x21" w/4 Magnetic Chucks
<u>Polishing Machines</u>			
3-720	10	Black & Decker Lathe	
3-1197	18	Hammond Polishing Lathe	VH-6D 6"
<u>Forcing Presses</u>			
3-22	18	Arbor	#4 Press
3-127	13	Niles	150 Ton Horiz. Hydro. 9" Ram
3-324	13	Lucas	150 Ton Horizontal
3-622	13	Lucas	50 Ton Vertical
3-656	10	Bliss Kick	Dimpling Press
3-694	15	Lucas	50 Ton Vertical
3-742	10	Bliss	#269 Foot Toggle Pendulum Press
3-754	13	Greenerd	#3-3/4
3-764	10	Gray	#1A Rubbling Press
3-786	18	Horizontal Hand Forcing Press	
3-811	18	Screw Press	Horizontal
3-862	18	Greenerd Arbor Press	
3-894	18	Greenerd Arbor Press	
3-995	10	Bliss	Dimpling Press
3-1072	19	Lake Erie	100 Ton Vertical
28123	18	Greenerd #4 Arbor Press	
<u>Arc Welders</u>			
3-726		Lincoln	
3-941	10		Portable
3-946	15		WD 33 Portable
3-947	7	G. E.	Portable
3-950	10	G. E.	WD 33 Portable
3-952	10	Lincoln	Portable
<u>Punch Presses</u>			
8-145	10	Bliss #3A	"C" Frame
9-165	19	Clev. "W" Punch & Shear	300 Ton
9-371	19	Clev. 12"	"C" Frame 50 Ton
3-472	15	Williams & White #14-1/2 Punch & Shear	

MANUFACTURING FACILITIES HARRISON WORKS

METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Punch Presses (Cont'd)</u>			
3-574	13	Bliss #4A	"C" Frame 75 Tons
9-588	15	Pels "PR"	"C" Frame 30 Tons
9-591	19	Clev. "X-500"	"C" Frame 500 Tons
3-641	10	Niagara #43	"C" Frame
3-666	15	Pels C-3-LU-17, 3 Gang	"C" Frame
3-667	15	Pels C-3-LU-17, 3 Gang	"C" Frame
3-686	18	Niagara Horn	"C" Frame 50 Tons
3-743	10	Z & H #10-5	"C" Frame
3-765	18	Niagara #59	"C" Frame 148 Tons
3-785	18	Adraiance #224	50 Tons
3-810	10	Adraiance #3	Inclinable 20 Tons
3-817	18	Bliss #304	"C" Frame 75 Tons
3-838	18	V & O #73	Foot Press
3-842	15	Bliss #3A	"C" Frame 50 Tons
3-859	18	Bliss #3A	"C" Frame 50 Tons
3-885	13	Oeking Comb. Punch & Shear	"C" Frame
3-904	18	Oeking	"C" Frame 10 Tons
3-912	18	Bliss #19	Inclinable 15 Tons
3-966	19	Buffalo #46	"C" Frame
3-1107	15	Buffalo #1-1/2 Punch & Shear	7/8" Cap.
3-736	-	Buffalo #3-1/2 Punch & Shear	1" Cap.
3-931	10	Niagara #47	"C" Frame
3-995	10	Bliss #8A	Foot Press
3-1061	13	Ferracut PG5	"C" Frame 75 Tons
3-1102	18	Ferracut PG5	"C" Frame 75 Tons
3-1103	18	Ferracut PG5	"C" Frame 75 Tons
3-1115	15	Thomas Duplicator	"C" Frame (Beams & Channels)
3-1116	15	Thomas Duplicator	"C" Frame (Beams & Channels)
3-1117	19	Clev. Horiz.	70-1/2 Tons
3-1160	10	Bliss #23	Inclinable 75 Tons
3-1168	10	Bliss #23	Inclinable 75 Tons
3-1179	10	Bliss #215	Inclinable 45 Tons
3-1180	10	Bliss #215	Inclinable 45 Tons
3-1181	10	Bliss #215	Inclinable 45 Tons
3-1182	10	Bliss #215	Inclinable 45 Tons
3-1198	10	Niagara	Inclinable 40 Tons
3-1705	10	Niagara #44	40 Tons
3-1714	18	V & O #3B	"C" Frame 30 Tons
4931	19	Long & Allstater "B"	"C" Frame
		Punch & Shear	
10031	13	Bliss #4A	"C" Frame 75 Tons
24001	19	Williams & White #15	"C" Frame 50 Tons

Riveting Machines

3-642	10	Grant #1-B-30	
3-675	18	Shuster "A" Riveter	Rotary
3-679	15	Hanna Portable	
3-812	18	Kobert	
4933	15	Hanna #1016	Pneumatic
3-1158	10	H1-Speed	
3-1128	18	Raybestos	3/16" Rivet

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MANUFACTURING FACILITIES HARRISON WORKS
METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Rolls</u>			
3-818	10	Reeves Former	
3-942	10	Roll Former	1/8" x 41" Capacity
3-944	18	Niagara	#R-1491
3-973	10	Rafter Type	
<u>Sanding Machines</u>			
3-673	13	Curtis	#64 Panel Sander
3-864	10	Mathison	7" Belt Sander
3-936	10	Mall	Flex. Shaft Polisher
3-972	10	Wysong & Miles	8-1/2" Belt
3-977	18	Peerless	#2 15-3/4" Capacity
3-1066	10	Otis	
3-1098	10	Curtis	8" Belt
3-1100	10	Curtis	8" Belt
3-1156	10	Curtis	8K2 8' Belt
3-1166	10	Curtis	8K2 8' Belt
3-1176	10	Curtis	8K2 8' Belt
3-1714	10	Smith	49" Bed Type Drum Sander
<u>Stripping Machines</u>			
34561	7	Wire Stripper	Hi-Speed
34562	7	Wire Stripper	Hi-Speed
<u>Sawing Machines-Metal</u>			
3-643	24	Racine	Duplex Portable Band Saw
3-963	10	Porter Cable	B5-236 10" Capacity
3-930	13	Marvel	#8 Band Saw
3-1039	10	Delta	#881C Band Saw 14"
3-1090	10	Marvel	Band Saw
3-1161	10	Marvel	Band Saw
3-1162	10	Marvel	Band Saw
3-766	18	Peerless	10" x 10" Hack Saw
3-1064	4G	Marvel	A.B.M. Hack Saw
3-1065	15	Marvel	Hack Saw
3-1154	15	Marvel	#9 Hack Saw
3-1155	10	Marvel	#9 Hack Saw
3-1419	15	Marvel	#9 Hack Saw
3-1001	18	Delta	#1600 Cutoff Saw
3-1113	10	W. T.	Cutoff Saw
3-1199	10		Abrasive Cutoff Swing Saw
3-1172	10	Marvel	Band Saw
3-1163	15	Porter	#43 Hydro.Cut Saw
3-1133	15	Delta	#20-305
3-1725	10	Marvel	#8M1 Band Saw 6 Speed
3-1726		Ohler	KA400 Hydro.Saw 5" Cap.
3-1728		Ohler	#1500 Auto.Saw Sharpener
3-1727		Ohler	#1000 Hydro.Saw 12-3/4" Cap.
9-543	23	Ryerson	#3 Friction Saw

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MANUFACTURING FACILITIES HARRISON WORKS

METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Shapers</u>			
1-2376	13	G & E	32" Stroke Horiz.
<u>Shearing Machines</u>			
3-341	4A	Young	Hand Shear
3-632	10	L & A	#2 Gate 124" x 1/4" Cap.
3-747	10	L & A	#4 Gate 100" x 3/16" Cap.
3-668	10	Amplex	#10 Tees & Angles
33-516	15	Amplex	#30 Rt. Beams & Channels
3-624	15	Cleveland	12" Shear
3-1112	10	Niagara	#810 10' x 1/4" Cap.
3-1013	19	Niagara	J6 Squaring Shear 3/8"x6' Cap.
3-1183	10	Niagara	#610 10' x 10 Ga. Cap.
3-1184	10	Niagara	#610 10 Ga. x 10' Cap.
3-1189	10	Niagara	#610 10 Ga. x 10' Cap.
3-1190	10	Niagara	#610 10 Ga. x 10' Cap.
3-1191	10	Niagara	#610 10 Ga. x 10' Cap.
3-1192	10	Niagara	#610 10 Ga. x 10' Cap.
<u>Slotting Machines</u>			
3-325	13	T. C. Dill Slotter	
<u>Staplers</u>			
3-1002	15	Universal Stapling Machine	
<u>Straightening Machines</u>			
3-692	10		Straightening Machine
3-773	18		Straightening Machine
3-1722	19	Williams	Twin Ram 75 Ton Hydro.
3-1723	19	Williams	Twin Ram 75 Ton Hydro.
3-1724	15	Williams	Twin Ram 75 Ton Hydro.
9-309	19		Port. Hand. Screw Press 13" x 15"
<u>Swaging Machines</u>			
9-612	19	Standard Rotary	For Thimble Rods
<u>Tapping Machines</u>			
3-1106	18	Snow	Capacity 3/8" Stl.
3-1148	23		Capacity 1/4" to 3/4"

MANUFACTURING FACILITIES HARRISON WORKS

METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Testing Machines</u>			
3-1042	10	B-5	#500 Sptweld. Tester
1-1233	13	Riehl	Testing Machine
34412	10M	Ernst Model RHR	Hardness Tester
34413	23	Ernst Model BMR	Hardness Tester
3-1282	23	Rockwell 30R	Hardness Tester 4"
<u>Threading Machines</u>			
3-1129	24B	Oster Pipe Threader	3/8"-2" Capacity
<u>Arc Welders</u>			
3-953	15		Portable
3-954	15		Portable
3-958	15	Lincoln	
3-959	15	Lincoln	
3-965	13	G. E.	375 Amps.
3-990	15	G. E.	Portable Transformer Arc Welder
3-991	15	G. E.	Portable Transformer Arc Welder
3-992	15	G. E.	Portable Transformer Arc Welder
26533	15	G. E.	Portable Transformer Arc Welder
			600 Amps.
26534	10	G. E.	500 Amps.
26535	15	Lincoln	
26549	15	G. E.	Port. Trans. Arc Welder
			500 Amps.
26704	10	G. E.	Port. Trans. Arc Welder
			600 Amps.
26722	19	G. E.	Port. Trans. Arc Welder
			500 Amps.
26726	15	G. E.	Port. Trans. Arc Welder 500 Amps.
26731	10	G. E.	Port. Trans. Arc Welder 500 Amps.
26732	10	G. E.	Port. Trans. Arc Welder 500 Amps.
26733	19	G. E.	Port. Trans. Arc Welder 500 Amps.
26735	10	G. E.	Port. Trans. Arc Welder 500 Amps.
26736	10	G. E.	Port. Trans. Arc Welder 500 Amps.
26738	10	G. E.	Port. Trans. Arc Welder 500 Amps.
26739	15	G. E.	Port. Trans. Arc Welder 500 Amps.
26741	15	G. E.	Port. Trans. Arc Welder 500 Amps.
26745	19	G. E.	Port. Trans. Arc Welder 500 Amps.
26748	15	Lincoln	D. C.
26749	19	Lincoln	D. C.
26752	15	G. E.	D. C.
26757	10	G. E.	Port. Trans. 300 Amps.
28835	10	Lincoln	500 Amps.
28837	10	Lincoln	"A20"
30057	19	Herco	Shield Arc Welder
30082	19	Wilson TW 300	VCH 300
188-4801	10	G. E.	
11887	24A		Portable Arc Welder
32805	10	G. E.	Portable Arc Welder 250 Amps.

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MANUFACTURING FACILITIES HARRISON WORKS

METAL WORKING PRODUCTION MACHINE TOOLS & EQUIPMENT

<u>TOOL NO.</u>	<u>DEPT.</u>	<u>MAKE</u>	<u>DESCRIPTION</u>
<u>Arc Welders (Cont'd)</u>			
32806	10	G. E.	Portable Arc Welder 200 Amps.
32807	10	G. E.	Portable Arc Welder
32808	10	G. E.	Portable Arc Welder 375 Amps.
32815	10	G. E.	#6WK15B Port. Arc Welder
32816	10	G. E.	#6WK15B Port. Arc Welder
32817	10	G. E.	#6WK15B Port. Arc Welder
32818	10	G. E.	#6WK15B Port. Arc Welder
32819	10	G. E.	#6WK15B Port. Arc Welder
33002	10	G. E.	#6WK15B Port. Arc Welder 300 Amps.
33003	10	G. E.	300 Amps. WD4-36 Arc Welder
33075	10	G. E.	300 Amps. Arc Welder
34407	15		WK30J-220/440V M/G
			Trans. Arc Welder
34408	15		Trans. Arc Welder
34409	15		Trans. Arc Welder
34410	15		Trans. Arc Welder
33058	10	G. E.	300 Amp. Wd43C-40V MG Welder
33059	10	G. E.	300 Amp. Wd43C-40V MG Welder
32705	4T	Nelson	Stud Welder
34434	10M	Graham	Std. Stud Welder 1/4" Cap.
34433		Nelwelder Power Unit	With Wheels

Spot Welders

3-970	10	Fisler	Gun Type Spot Welder
27043	10	Thompson	150KVA
27044	10	Thompson	150KVA
27045	10	Thompson	150KVA
27046	10	Thompson	150KVA
26808	10	Sciaky PMC	65KVA-150KVA
26809	10	Sciaky PMC	65KVA-150KVA
26935	10	Sciaky PM-COS-16	
28392	15		Welder
10424	10	Otis	#4
30058	19	Herco VCH-300	
32812	10	Herco	
32813	10	Herco	
32814	10	Herco	
32820	10	G. E.	150 Amps.
32821	10	G. E.	150 Amps.
32822	10	Sciaky	Press Type
32823	10	Sciaky	Press Type
34414	10M	Sciaky PMCO IT-75-36	3 Phase
34415	10M	Sciaky PMCO IT-75-36	3 Phase
3-752	10	W. M.	
3-693	10	Thompson	#254
3-771	10	Gibbs	#224

Winding Machines

1-160	4W	Otis Winder	For Wire Rope
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There remained to be overcome, however, the inherent limitations of human operators. At speeds in excess of 600 feet per minute the demand imposed on operators for split second reactions to blurred floor numbers, flashing signals and requests from passengers proved to be greater than that with which the most skilled operator could comply. This apparently insuperable obstacle was completely overcome by the Otis Elevator Company by a series of inventions beginning about 1920, which resulted in the development of Signal-Control. Signal Control completely relieves the operator of all duties except that of pressing buttons to register the destinations of passengers and closing the door and starting the car. The ability of the operator is no longer a limiting factor in determining the attainable or desirable speed of an elevator. As a matter of fact, one of the factors limiting car speed is the rate of change of atmospheric pressure to which passengers can comfortably adjust themselves.

Otis Signal Control made available elevator speeds up to 1400 per minute, and made commercially practicable such monumental structures as the Empire State Building, New York, which towers 1248 feet above Fifth Avenue and is equipped with 58 Otis Signal-Control Elevators.

Otis developments, extending over a period of ninety-one years, have created and are continuing to maintain a line of elevator equipment specifically designed to fulfill all the requirements of vertical transportation so far encountered.

THE AERONAUTICAL DIVISION

After the outbreak of the second World War on September 3, 1939 the Otis Elevator Company began to convert existing plants to the production of war materials, just as they had done in 1915. Contracts for the production of various war materials were obtained for the Yonkers, Harrison and Buffalo Works.

When France fell in 1940 and Churchill could only promise Britain "Blood and Sweat, Toil and Tears" the United States Government realized what her position was and could be. Aircraft plants had been swamped with orders from the English and French Governments and had expanded rapidly, but not rapidly enough to meet the demands. The United States Government took over most of their orders and immediately demanded further expansion. Lack of experienced administrative personnel proved to be one of the chief stumbling blocks to expansion and increased production, and the aircraft industry began a frantic search for ways and means to overcome this particular barrier.

The Wright Aeronautical Corporation, aware of the Otis Elevator Company's world wide reputation for organization and believing that Otis could call on their key personnel from their other plants, commenced negotiations for a sub-contract with this company to manufacture crankcases for their Fourteen-Cylinder Cyclone engines, a contract much too large for any Otis Works to handle, as the floor space required was beyond anything Otis had available.

Winthrop B. Edwards, European General Works Manager, who had been directing all Works of the Associated Companies in Europe and who had been recalled from London in July 1940, was assigned, in the latter part of September 1940, to the task of studying the possibilities of providing facilities to carry out this proposed contract. After surveying the Buffalo Works Mr. Edwards recommended that only a new building to be erected on vacant land of the Harrison Works at Harrison, N. J. could provide the necessary floor space.

On October 1, 1940 Mr. J. H. Van Alstyne, President of the Otis Elevator Company, approved Mr. Edwards' recommendations with regard to the proposed new Plant at Harrison, subject to approval by the Wright Aeronautical Corporation and the War Department. By November 8th arrangements with the Architects, Eppe & Kahrs of Newark, N. J., were completed for the development of plans and specifications. Approvals were received subject to further approval by the War Department, Materiel Division, Army Air Forces, at Wright Field and the Defense Plant Corporation.

Thus the Aeronautical Division was born and Mr. Edwards was appointed Manager.

Having been in London and Paris during the first year of this war, Mr. Edwards was aware of the urgency of the rearmament program and he set "Speed" as the keynote of the new Aeronautical Division. That he lived up to this keynote can be seen by a glance at some of the pertinent dates in the history of our Plants.

An Appendix "A" covering the entire project, buildings and equipment was submitted to the War Department, Materiel Division, Army Air Forces, at Wright Field on November 29, 1940 and approved in December 1940.

The Defense Plant Corporation lease agreement was signed on December 24, 1940 and the Wright Aeronautical Corporation Parts Contract was signed on January 31, 1941.

The structural steel and bulkhead construction contracts were awarded on January 5, 1941; the piling contract on the 21st of the same month, and the general contract awarded to Walter Kidde Constructors was signed on March 6, 1941.

Structural steel started arriving on April 21, 1941 and on May 19, 1941 all structural steel had been erected, plumbed, rivetted, and completed. Twenty-one hundred tons of structural steel completely erected in twenty-one working days.

The first machine tools were placed in position on the Plant floor on July 28 and were operating under power on August 21, 1941, although at this date the building was still in the hands of the contractors.

On October 11, 1941 the first shipment was made consisting of three crankcases.

By October 28, 1941 shipments consisting of fourteen finished crankcases had been made. Just six months after the first delivery of structural steel for the building.

While the new building was being planned and constructed, key men from Otis Plants in Europe, Asia and the United States were being transferred to the Aeronautical Division and were at work building the framework of the new organization.

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The key men, forming the nucleus of the organization today, were:

Mr. W. B. Edwards	European General Works Manager London, Paris, Berlin, Naples	Manager	10/ 1/40
Mr. R. H. Burns	N. Y. Treasurer's Office	Personnel Director*	11/ 1/40
Mr. B. DeGraaf	N. Y. Engineering Dept.	Engineer	12/ 1/40
Mr. E. G. Raymond	N. Y. Auditor's Office	Cost Accountant	12/31/40
Mr. S. P. Collins	N. Y. Purchasing Dept.	Buyer	1/ 1/41
Mr. E. M. Fabrizi	Production Engineer Paris, France	Production Engineer	1/16/41
Mr. D. A. Roberts	Yonkers Works	Personnel Director	1/27/41
Mr. W. A. Miller	Yonkers Works	Plant Engineer	2/ 1/41
Mr. E. F. Day	Yonkers Works	Engineer	2/15/41
Mr. R. M. Conway	Yonkers Works	Superintendent	2/17/41
Mr. H. R. Fardwell	N. Y. Auditor's Office	Auditor	3/ 1/41
Mr. F. J. Rogers	Harrison Works	Asst. Production Engineer	3/ 1/41
Mr. F. E. Plowman	Production Engineer, Tokio, Japan	Asst. Production Engineer	7/ 1/41

* Transferred to New York Office 7/13/42 for other important duties.

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An old foundry building, used as a warehouse, in the existing Harrison Works of the Company, was renovated and machine tools to be used in the manufacture of crankcases were installed in a production line formation.

Under the direction of Mr. L. W. Whitton, Assistant Manager, twelve experienced machinists were requisitioned from the Yonkers Works and given a one-month course in the Crankcase Department of the Wright Aeronautical Corporation. After this course, with these twelve men as instructors, the foundry building was opened as a training school on May 5, 1941. Each week approximately thirty unskilled men from all walks of life were hired to be taught in the school, after a period in the vocational schools of Newark, Jersey City and Bayonne. In this way approximately seven hundred men were trained. When Plant Number One was opened a trained force of men was on hand to operate the machine tools as fast as they were ready. The training school was abandoned on October 3, 1941 and the men who had been schooled there were in turn ready to train other beginners in the New Plant.

Thus the Aeronautical Division, which at the end of December 1942 has a personnel of close to two thousand, was built around an administrative staff of about thirteen key men and twelve machinists. Almost all of the rest have come to us with no machine shop experience, and none with any experience in aeronautical manufacture. They have come from all walks of life, all classes of society, white and colored, male and female, former big salary earners, W.P.A. workers and juniors, but all American Citizens.

The treacherous attack on Pearl Harbor, December 7, 1941, changed the National picture from Defense to War and schedules were stepped up as Defense Plants became War Plants. This Plant went on a twenty-four hour, seven day week operation and Mr. Edwards, foreseeing a shortage of men and knowing what women had done in our own Plants in Paris and London, particularly after War was declared, ordered the immediate hiring of women for all jobs in the Plant.

Seven Women War Workers, hired for production work, entered our employ on December 22, 1941. As production needs demanded, more women war workers were hired, and as men left to join the Armed Forces they were replaced by women. At present almost 30% of the shop personnel is composed of women and they are employed on practically every type of job and machine in the two Plants. More than three hundred and fifty men have been released to join the Armed Forces and their places taken by women.

The Aeronautical Division was, therefore, a pioneer in the use of women in occupations which were previously open only to men and where women were believed to be incapable. It is only just at this time to say that our Women War Workers are doing a fine job, take great pride in their work and have proven themselves to be good, capable producers.

On February 2, 1942 the War Department, Army Air Forces, placed our inspection system and organization in Class "A", meaning complete approval of same.

The Treasury Department awarded us the Minute Man Flag on June 19, 1942 for having more than 90% of our employees subscribe to War Bonds through payroll deduction. On October 23, 1942 the same government agency gave us a "T" to be added to the flag to show that more than 1% of the total payroll was being subscribed for these War Bonds.

An armed and uniformed Guard Force guards the plants night and day. These guards are also trained as firemen and air raid wardens, and have been schooled in First Aid. They have also been sworn in as auxiliary members of the Military Police.

Every effort has been made to provide facilities for the employees' comfort and to institute services within the Plant which would enable employees to lose as little time as possible.

On September 25, 1941 even before construction was finished, a modern cafeteria, seating four hundred, was opened to provide hot meals. Since Pearl Harbor this has been operated on a twenty-four hour basis, serving breakfasts, lunches and suppers, at cost, to all shifts. In addition mobile food wagons make rounds of the shop floors, twice in the twenty-four hours of the day, serving hot and cold snacks to workers at their machines between meals. Besides all this, vending machines for the sale of biscuits, candy, milk and soft drinks are located at convenient places throughout both Plants.

Arrangements made with the Draft Boards of Hudson County, New Jersey, enabled us to register all draft eligibles within the Plant, thus saving our men from standing in line at registering places many hours, with the subsequent loss of production. Similarly, automobile license plates and drivers' licenses were sold inside the plant, through the courtesy of the Motor Vehicle Commission of the State of New Jersey.

As it was impossible for men of the day shift to obtain haircuts without losing time, Mr. Edwards installed a barber shop in a room off the shop floor. Male employees have this service, on company time, twenty-four hours each day, by making an appointment through the timekeeper's office. In the same shop a manicurist takes care of the girls' hands one day per week.

A United States Post Office has been established in the Plant and employees may buy money orders, stamps, etc., as in any branch post office.

Federal income tax officials set up a Bureau in the Plant to assist employees with their income tax problems.

Parking facilities are provided for employees' cars on Company property adjacent to all Plants. A Gasoline Service Station was installed for the convenience of car owners and as an aid in rationing control. The forms used to allot gas in necessary quantities at this station formed the nucleus of a "Ride Sharing Plan" which was adopted long before any similar scheme was publicized.

Assistance is also rendered by the Personnel Department to automobile drivers with their gas rationing forms and problems, and a government tire inspector has been assigned to this plant. All through the courtesy of Mr. James Kerney, Jr., State Head of the O.P.A.

As the girls work long hours they have difficulty in attending to their shopping needs without taking time off, so a big New York Department Store displays a line of women's goods at intervals in the Plant. Here the girls can select merchandise, covering a wide range of needs, from fur coats to panties, during their lunch periods and have it delivered to their homes.

We broadcast musical programs over our public address system at intervals throughout the twenty-four hours of the day. We have also broadcast speeches of the President, Winston Churchill and other important features, such as the World Series Baseball Games and both college and professional Football Games.

Finely equipped first aid rooms operating around the clock, with a staff of registered nurses and with doctors visiting the plants at stated hours daily, provide for all necessary medical attention. Our own ambulance is always on the job for hospital cases.

Delivery schedules were doubled and trebled after America's entrance into the war, and the Wright Aeronautical Corporation on March 6, 1942 asked us to increase our production four and one-half times the original contract. There being no existing buildings which could be converted to meet such a schedule, Mr. Edwards recommended that a new building be erected on land adjacent to the first Plant. This was agreed upon between Otis Elevator Company and the Wright Aeronautical Corporation.

An Appendix "A" covering this project was mailed to the War Department, Materiel Division, Army Air Forces, Wright Field, Dayton, Ohio, on March 20, 1942 and approval was received from the Defense Plant Corporation on April 22, 1942.

In the meantime, feeling sure that the project would be approved, no time was lost in going ahead with the plans. Drawings and specifications were mailed to the piling contractor for bids on March 28, and to structural steel contractors on April 6. On April 24 "The Green Light" to go ahead with the project was received exactly five weeks after the Appendix "A" was mailed to Wright Field.

Excavating started on April 29 and the next day the pile driving unit was brought to the site and on May 6 began driving piles. This part of the contract was completed on June 10.

The general contract awarded to Walter Kidde Constructors for Plant Number Two was signed on May 5, 1942 and the same day a contract was signed with the Architects, Epple & Kahrs. By June 29 all foundations were finished, and all underground piping complete on July 15. Concrete was poured in the first floor section on July 16 and rapidly pushed forward to completion. Thus, much construction time was saved by completing the floor before structural steel work and walls were started.

The first truckload of structural steel was delivered to the job on Friday, August 28 and thirteen columns were erected by nightfall. To rush erection as fast as possible the Defense Plant Corporation agreed to work craftsmen on the building ten hours per day, six days per week.

On Tuesday, September 8, bricklayers started laying brick while the structural steel erectors were still at work. The last steel was rivetted in place at noon on September 16, 1942 and thus twelve hundred tons of structural steel was completely erected nineteen days after the first column was placed in position. All outside brickwork on the walls was completed in October and by November 8 power was available for the operation of machine tools.

Several machine tools were put into production in Plant Number Two on November 12, 1942, seventy-six days after the first steel was delivered. A night shift was started on November 16, four days later and quickly thereafter the entire plant went into full production, up to the limit of the machine tools available.

This new Plant Number Two has all the facilities and services for employees which are available in Plant Number One — a barber shop, first aid room, a magnificent cafeteria (seating six hundred), locker rooms, showers, personnel offices, etc.

The climax of this short but brilliant career of the Aeronautical Division came when we received a letter from Robert Patterson, Under-Secretary of War, stating that we had been awarded the Army-Navy "E" Award for Excellence. The date of this award letter is October 24, 1942, just twenty-two months after the signing of the lease agreement with the Defense Plant Corporation, and fourteen months after the first machine tool was operated in Plant Number One.

This award was presented to Mr. J. H. Van Alstyne, President of the Otis Elevator Company by Lt. Col. William J. McKiernan at ceremonies which were held in Plant Number Two on November 17, 1942.

These ceremonies were attended by approximately twenty-five hundred employees and guests and were broadcast over Radio Station WAAT.

The management and employees of the Aeronautical Division here firmly resolved that the unflagging spirit which brought them this high honor would continue until our country emerges victorious from a war which it did not seek or wish for.

Thus, has the Aeronautical Division, the Baby of the Otis Elevator Company, in less than two years, grown from birth to manhood.

OTIS HARRISON PLANT PARALLELS

GROWTH OF HUDSON COUNTY

The Harrison Plant of Otis Elevator Company was opened for business on February 1st, 1910. Prior to that time, most manufacturing had been done at the company's original and rapidly expanding plant in Yonkers, New York, However, additional expansion made more space imperative and a site was chosen to facilitate easy shipping and quick transfer of material by water from the new plant to Yonkers. It may be possible that, aside from its many advantages as an industrial location, the site was first investigated because back in 1851 Elisha Graves Otis, then a master mechanic, was employed by one Josiah Maize, a manufacturer of bedsteads and furniture, with a factory at Bergen on the Passaic River. It was later, in 1853, that Mr. Otis invented the first safe elevator.

The original Otis plant in Harrison comprised eight buildings occupied by the Marine Engine and Machinery Company, located on the east bank of the Passaic River, directly opposite the business center of Newark. It included buildings ranging from 332 feet long by 100 feet wide to a warehouse 30 x 60 feet for storage. The original layout had a machine shop, an iron foundry, a structural steel shop to assemble elevator car frames and safety devices, a forge shop, power house and general office building. Improvements through the years have added ten new buildings, modernized all the original structures and spread the plant over about forty acres.

A building program was started in 1911 and continued in intervening years, including two world wars, to the present. The first large addition was in 1913 when a new structural shop, measuring 450 by 200 feet was completed. This was the first of three buildings erected in the pre-World War I period which provided an extra quarter million feet of floor space. Immediately after the war, Otis began adding to its Harrison property by purchasing small homes situated between the plant and the Passaic River. By 1923 its holdings had reached the river and when the abortive Federal Baseball League folded, a ball park of about 10 1/2 acres, directly across the street from the Harrison Works was for sale and was bought by the Company. It is now used as a parking lot.

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Subsequent construction included an Oil Products Building in 1926, and in 1928 a building of 115,000 square feet of heavy capacity floor space for general manufacturing was added. The same year also witnessed the opening of the Central Heating Plant, designed not only for heating but to provide facilities for cold storage handling of highly explosive powdered fuel.

During World War II, Otis engaged in many important Government projects and two additional buildings were erected. One, devoted to the manufacture of aeronautical parts, was retained for use as a central administration building and for hollow metals fabrication.

From four original city blocks, the Otis Harrison Plant has grown to an area of about 40 acres, with eighteen buildings manufacturing products used all over the known world. In its constant course of construction and addition perhaps the most amusing incident occurred about forty years ago. Seems that one of the original buildings in the old Marine Engine Company housed a number of containers of natural gas. These would explode at intervals, after which, the place would have to rebuild. When Otis decided to raze this structure to make room for another unit, it exploded conveniently, two days before the razing was to take place.

3/8/71

zg

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Two shears of the battery of seven used for cutting sheet steel for elevator doors.

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Operating Improvements Reduce Manufacturing Costs

By David List

BRIEFED: The cost-reduction program of the Otis Elevator Company is a comprehensive one. Tools and equipment were modernized. Some items formerly subcontracted are now made by the company. A new production and inventory control system was installed. Special safety training was also introduced.

HIGHLIGHTING a continuing policy toward integration and standardization in the manufacture of custom-built elevators and escalators, the Otis Elevator Company recently effected a notable expansion of productive facilities at two of its plants. These new productive installations are merely one example of a number of far-reaching economies that have been recently introduced, including the modernization of existing tools and equipment, the inauguration of a methods department, the installation of a new production and inventory control system, and the institution of special safety training and other practices affecting employee relations.

Illustrative of the policy of manufacturing for its own use in the production of elevators and escalators, Otis has just installed in the Harrison Works a new sheet-metal fabricating and paint-finishing plant which now makes possible the complete manufacture of metal hoistway doors and door frames where these were formerly subcontracted or obtained from outside sources.

The new plant, which provides for the application of line production methods to the manufacture of doors and door frames has been made possible as the result of a 1-1/4 million dollar investment in 70 items of new equipment consisting of

bending brakes, shears, spot welders, inert-gas metal-arc welders, punch presses, sanders, etc., and a complete paint finishing system consisting of spray booths and drying ovens served by a continuous mechanical conveyor line.

Elevator doors consist of two sheets of 14-gage steel or ornamental metal. After being cut, punched and shaped, the sheets are then fitted and welded together to form complete doors. They are then hooked to a moving conveyor which carries them through successive stages of the painting or finishing process. The doors are spray painted with a prime coat, two surfacing coats, and three coats of colored enamel. Each coat of paint is baked dry in heating ovens with imperfections removed by rubbing, puttying, and glazing. To get uniform quality in the paint-finishing process, filtered air is pumped into a pressurized room while a slightly smaller volume of air is exhausted from spray booths. Plant safety is promoted by having paints mixed in an explosion-proof room from which they are piped to the spray guns.

Considering the fact that it has normally purchased 25,000 doors and 12,500 frames each year from outside sources, it is anticipated that the company will be able to get higher quality elevator entrances at

no increase in cost as a result of the new expansion project. With greater efficiency ultimately expected, similar techniques are being applied to the manufacture of elevator cars.

Along with the recent addition of facilities at Harrison, the company has invested \$80,000 in the modernization and expansion of its plastic-molding department at Yonkers. Through the acquisition of three automatic plastic-molding machines and nine hand-operated molding processes, Otis expects to obtain further economies through the manufacture for their own use of thermosetting plastic molded parts.

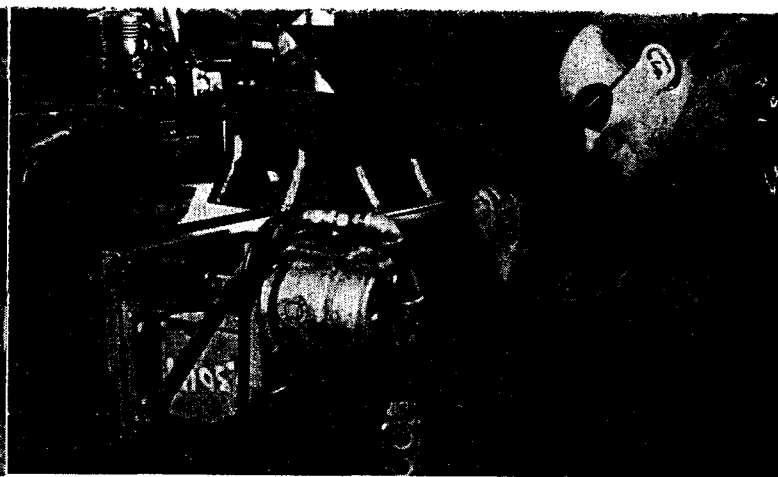
Machine Replacements

In keeping with the overall economies anticipated at the Harrison and Yonkers Works, Otis has replaced a large number of machines with new and more modern equipment. The following are representative examples of equipment replacements introduced into various operating departments:

A new precision machine used in boring or machining wheel-castings for elevators was recently installed to replace equipment formerly used for this purpose. The new machine cost \$15,000, but made possible a saving of \$10,000 in one year, thus paying off 67 per cent on the original investment. In another department, a new triple head



Spot welding reinforcing strips on inside door panel.



Welding edges of inner and outer panels of door together.

bolt threading machine costing \$4,600, was introduced, resulting in a saving of \$800. In still another department, a new welding machine was installed for use in the welding of reinforcement strips to the backs of elevator cars. While it spent \$1,200 in purchasing the new equipment, the company was able to save as much as \$1,300 by the end of the first year of operation.

The series of equipment replacements outlined are part of a continuing program of cost-reduction which was formally instituted by the company in 1945 in anticipation of the return of more competitive conditions in the elevator industry. The program was established with the object of encouraging greater plant efficiency through a concerted attack upon costs in all phases of manufacturing operations. Under the program, any proposal concerning the introduction of more effective machines or procedures than those currently in use may be originated in the Works and submitted for approval by the methods department. The annual saving directly attributable to the program has already reached the level of \$60,000 a year for the four-year period in which it has been in operation.

A particular feature of the program employed at Otis is that all the necessary paperwork has been reduced to a minimum and all the pertinent information required can be shown on a single form providing space for the original cost-reduction proposal, its final disposition, and a comparison of actual savings with estimate.

Cost-Reduction Proposals

The program is designed to provide prompt and immediate attention to recommendations forthcoming from any of the operating departments concerning the introduction of improved methods, equipment, or engineering specifications.

Here are some examples of cost-reduction proposals resulting in manufacturing method improvements through the use of equipment permitting the combination, reduction, and elimination of operations formerly employed:

(1) One particular proposal resulting in improved methods originating in the switch assembly department provided for the installation of a new wire measuring, cutting, and stripping machine along with an accompanying eyelet assembly mechanism. The new equipment now used in switch assembly wiring is completely automatic and combines what was formerly manual or bench assembly with machine-forming and trimming. The increased efficiency brought about through this particular manufacturing improvement has resulted in a saving of \$16,000 in prime manufacturing costs.

(2) A second proposal that was approved led to further improvements in processing methods. This provided for the installation of four new tracer lathes resulting in a saving of \$12,000 per year. The new machines call for only one turning operation, where several operations (both turning and grinding) were formerly required.

(3) A third cost-cutting proposal providing for the installation of a 250-ton horizontal bulldozer used in the manufacture of structural supports resulted in the elimination of several operations ordinarily required in the fabrication of structural steel. The new equipment, which permits the cold-bending of structural steel, has eliminated the necessity of pre-heating, thus bringing about a saving of \$6,000 in prime manufacturing costs.

Beyond the dollar savings that have already been achieved through formal cost-reduction and other means, here are some outstanding examples of operating improvements being realized in both plants:

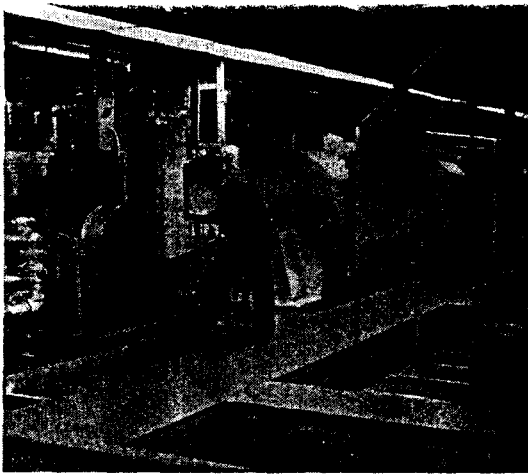
(1) Cutting down the amount of time ordinarily required for machine operation, thus releasing equipment more readily for use in other phases of production; (2) Keeping stock shortages down to a minimum; (3) Reducing the amount of floor space formerly occupied by machines; (4) Stabilizing the work load by eliminating production peaks and overtime expenditures; (5) Improving the quality of production by keeping scrap and spoilage losses to a minimum.

The key organization governing all decisions affecting the adoption of cost-reduction proposals concerned with the introduction of such major changes as method improvements, product and equipment modernization and standardization, is a new unit called the methods department. This unit is directly responsible to the vice president in charge of operations and was formally inaugurated in August, 1949.

In line with the ultimate objective of promoting greater efficiency through standardization, the prime task of the newly organized methods department is to plan and control the ordering and manufacture of all new or changed products so as to enable operating departments to turn out material of satisfactory quality in the required time, at the lowest available cost, and in a suitable place. Production planning at Otis was originally performed on a decentralized basis, with the individual department responsible for introducing its own changes. Today, the methods department has taken over this responsibility and has centralized the performance of this function within each of its component groups.

Special Groups

To carry out effectively this responsibility, the constituent personnel in the new department have been organized to form special



Topside of the gas-fired ovens for drying and baking.



Mounting parts on monorail conveyor for trip through finishing operations.

groups having the following functions:

(1) A Project Group

This group, consisting of planning and methods engineers, is primarily concerned with the analysis of new or revised products prior to their introduction into manufacturing, with a view toward insuring maximum standardization of product, economical utilization of existing inventories, proper anticipation of potential bottlenecks, ease in specifying orders, and minimizing the necessary cost of operation. This group is responsible for preparing any type of pertinent information throwing light on the benefits or disadvantages of a given project, the production or standardization status of equipment affected, and similar matters.

(2) A Tool Group

This group of engineers is concerned with the tooling requirements of all new or revised products under consideration. It must determine the most economical type and quantity of tool to be utilized; estimate its cost; select, prepare and release orders for new tools and equipment; work with members of the project group (planning and methods engineers) in determining the economic feasibility of introducing a new design, and serve in the capacity of general tool consultant to all operating divisions of the company.

(3) A Cost Group

This group is composed of specialists whose function it is to prepare cost information along the following lines: reports concerning tools expenditures, the accomplishment of projects already executed, the performance results of capital expenditures, status of cost reduction proposals, estimates of prime manufacturing costs. This group also prepares and processes all

trouble reports and credits.

(4) An Inventory Group.

This group, consisting of specialists in stock and inventory control, prepares and issues production forecasts; does the processing of elimination surveys; analyzes and answers all inventory problems; determines the effect on current inventories of the introduction of new equipment; prepares the release of all project coordination schedules as well as all details of the new manufacturing process.

(5) A Special Assignment Group

This group is responsible for all production planning which is not normally performed by members of the other groups. Among the problems it may be called upon to solve, from time to time, are those concerning the introduction of new equipment for use in foreign production, replacement of one operation with a more economical substitute, and determination of which plant can best manufacture a particular part.

Inventory and Control

A special inventory and production control procedure recently installed at Otis has accomplished a reduction of 30 per cent in the value of stocks on hand as well as a 25 to 30 per cent cut in the amount of storage space formerly used.

Starting with a dollar sales forecast, inventory and production control is a bookkeeping procedure for keeping inventory and production levels progressively adjusted to actual sales of elevator and escalator equipment.

Because of the large number of special orders typical of production at Otis, there are often wide differences between actual and estimated sales which have to be constantly adjusted in properly evaluating current inventory needs.

The system currently employed eliminates much of the guesswork

that is a common factor in inventory control. Under the procedure previously used at Otis Elevator, it was necessary to keep up a cumbersome accounting system which made it difficult to exercise adequate control over stocks, particularly where the demand for the finished product varied as widely as it does in the case of elevators.

The considerable saving brought about by the new system of inventory and production control is more fully reflected in some of the following changes, which represent improvements over the technique formerly used:

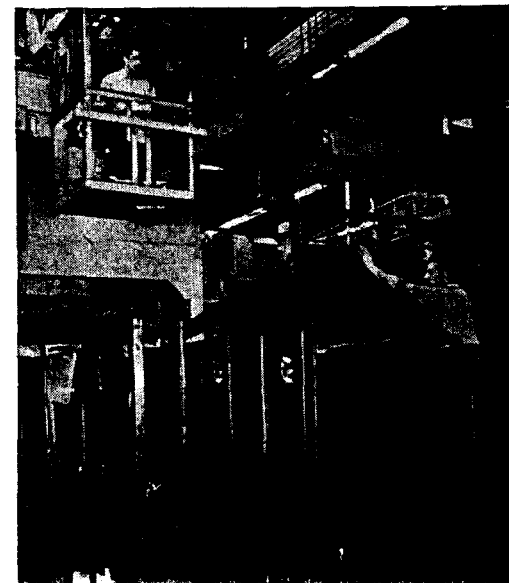
(1) The volume of stocks on hand has been considerably reduced, thus tying up less money in raw materials, finished goods and labor.

(2) A system has been introduced under which the production of different parts and materials is scheduled according to the particular order which calls for their shipment on a given date, determined by construction requirements at the building site.

Because of the benefits that have been brought about through the operation of this new procedure, the works managers have now been able to achieve one of their major objectives—that of minimizing the amount of time spent in the processing, inspecting, and physical handling of goods for shipment. Under the plan, production has been controlled to such a point that the company is now making 85 to 90 per cent of its deliveries on predetermined schedule.

With other departments responsible for effecting dollar savings through the introduction of new equipment, more effective methods of manufacturing, inventory and production control, etc., the industrial relations division of the com-

Assembly of elevator cars.



Manufacturing Cost Reduction Analysis

TO: WORKS DIVISION
NEW YORK (3 copies)

Project No. _____ Date _____

Name of Plant: _____ Plant No. _____

Annual Rate of Use (Normal) _____ Are Engineering Changes Contemplated? (If so, when?) _____

TO BE ANALYZED RE:

☐ Change in Present Process
☐ Set Up (Ind. Feeds, Speeds, etc.)
☐ Machine Tool Used
☐ Cutting Tools
☐ Method or Operation
☐ Jigs, Fixtures, Dies, Etc.

☐ Type
☐ Type Eliminate
☐ New

☐ Single Change
☐ Alter

☐ Multiple
☐ Combine

☐ Change in Design
☐ Pattern
☐ Material
☐ General Construction

☐ Purchase vs. Manufacturing

TO ACCOMPLISH:

☐ Reduction in Cost
☐ Machining or Fabricating
☐ Material Erection

☐ Assembly
☐ Waste Drafting

☐ Testing or Inspection
☐ Shipped

SUMMARY of ANALYSIS and RECOMMENDATIONS:

Signed: _____ (over)

Form 2746 (10-47)

ESTIMATED COST REDUCTION (By Works)

Annual Rate of Use (Normal) _____ Pieces _____

Prod. Ct.	Units	Labor	Material	Per Piece Total	Per Year Total
Present Works Cost					
Expected Works Cost					
Gross Annual Reduction					

ESTIMATED COST TO EFFECT RECOMMENDATION:

Pattern _____
Jigs, Fixtures, Dies, Etc. _____
Machine Tools _____

Total _____

TO: _____ WORKS
Proceed as follows: _____

Assigned To: _____

ACTUAL COST REDUCTION (By Works Division)

Works Division _____

	Units	Labor	Material	Per Piece Total	Per Year Total
Previous Works Cost					
New Works Cost					
Gross Annual Reduction					

ACTUAL COST OF RECOMMENDATION:

Budget No. _____ Pattern _____
Budget No. _____ Jigs, Fixtures, Dies, Etc. _____
Budget No. _____ Machine Tools _____

Total _____

Net Annual Saving _____

Form used in analyzing manufacturing cost reductions.

pany can be credited with making its own contribution to cost-reduction through greater stress on employee safety and training.

Special Safety Program

Knowing that protection against occupational hazards means reduced absenteeism and consequently increased production, the industrial relations department has recently inaugurated a special safety program. The program not only provides for continuing attention to safety in each of the local plants, but also promotes nationwide safety contests in which plant employees compete.

To implement the local program at Otis, a plant safety committee, consisting of foremen and representatives of each of the Works Managers, has been organized with the purpose of bringing safety education to every individual worker in both plants. As a consequence of the committee's efforts, posters are now being used increasingly as a means of convincing workers of the necessity of wearing protective gear at all times in the course of operations.

A specific example of how the safety committee has been instrumental in eliminating potential hazards of machine operation—with a consequent saving in possible man-

hours lost—was represented in the case of several punch presses performing blanking, forming and piercing. In operating the machine, the worker was required to insert his hand into the press for the purpose of feeding and extracting the necessary parts. It was found that by tilting the machine, instead, a slide mechanism could be utilized for the purpose of inserting the parts, while an air process could be employed to eject them. This change resulted in giving the worker greater element of safety in the use of his hands.

Officials in the industrial relations department feel that the newly instituted safety program at Otis is making considerable headway in the campaign to eliminate losses growing out of plant injuries and accidents.

As a further means of reducing operating costs, the industrial relations department is exercising greater selectivity in the screening of job applicants and constantly maintaining and improving personnel standards. Paralleling the education program which was successfully conducted among field installation crews at the end of the war, it is expected that special training in cost-reduction will be given to all employees through the training facilities of this department.

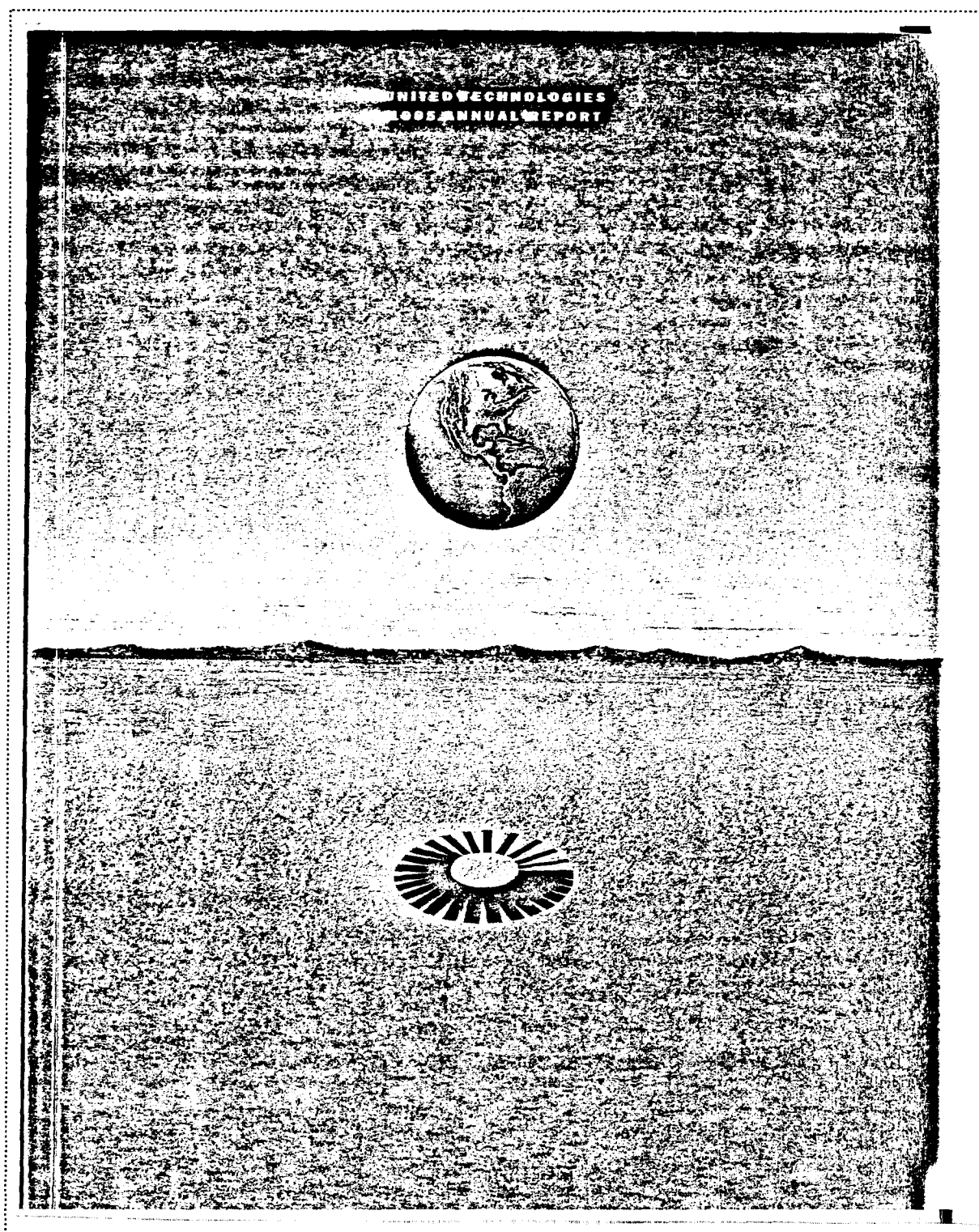
Another aspect of industrial relations practiced by Otis provides for participation by factory workers in a wage incentive system. This was first installed back in 1926, and no appreciable changes in the plan have had to be made over this period.

The system has had a salutary effect upon plant productivity. It has yielded workers a relatively high take-home pay, and accounts, in part at least, for the tranquil labor relations which have existed in the plants.

Moreover, it has been an instrument for improving management techniques; prompt availability of materials used in production; better utilization of machines with proper feeds, speeds and tools, and reduction in manhours lost through production delays.

Besides inventory reductions, permitting the release of capital funds tied up for this purpose, as well as reduction in the space needed to store these inventories, the company is now consolidating all of its stocks so as to promote more effective layout in relation to productive machines and equipment. This step has not only served in reducing the physical amount of haul and traffic to which materials have been previously subjected, but has also stimulated a considerable improvement in housekeeping as well.

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